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State of Rhode Island and Providence Plantations

SPECIAL REPORT

OF THE

COMMISSIONER OF PUBLIC SCHOOLS

RELATING TO

INDUSTRIAL EDUCATION

AS AUTHORIZED BY A

RESOLUTION OF THE GENERAL ASSEMBLY

APPROVED APRIL 20, 1910

PRESENTED TO THE GENERAL ASSEMBLY MARCH 28, 1911

PROVIDENCE:

E. L. FREEMAN COMPANY, PRINTERS TO THE STATE.

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State of Rhode Island

RESOLUTION (No. 8, 1910) passed by the General Assembly, directing the Commissioner of Public Schools to report the needs of this State in respect to industrial education, and approved by the governor, April 23, 1910.

Resolved, That the commissioner of public schools be and he hereby is directed to make an investigation of the conditions and needs in this State in respect to industrial education, including agricultural education, and to investigate the practice and progress of industrial and agricultural education in other states, and to make a report thereon, with his recommendations, to the general assembly at its January session, A. D. 1911.

State of Rhode Island

To the Honorable the General Assembly of the State of Rhode Island:

In compliance with the requirements of Resolution No. 8 of 1910, passed by the General Assembly and approved by the Governor, the Commissioner of Public Schools respectfully presents to your honorable body the following report on industrial education.

WALTER E. RANGER,

Commissioner of Public Schools.

MARCH 28, 1911.

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REPORT OF THE COMMISSIONER OF PUBLIC SCHOOLS ON INDUSTRIAL EDUCATION

I. INTRODUCTION

The chief aim of this report is to present to members of the General Assembly such facts of industrial education as may seem helpful in determining what legislation is desirable for its support and direction in this state. In accord with established law and practice in public education, the part the state may take in providing ways and means for desirable industrial education is distinct from the duties of towns and cities. The enactment of law involves the adoption of general policy for the whole state, while a municipality is free to adopt means to local needs. Obviously it is unwise for a state to attempt experimentation that from its nature is permissible only in local administration; but legislative action is justified, and may become imperative, when educational needs are clearly revealed by conditions and public demands. For these reasons, in the preparation of this report the question of what legislation is needed in this state is kept constantly in mind, facts of law and state administration are made prominent, and only such information is included as seems to throw light on the main question. For the end as indicated, the report attempts to present various types of industrial education, either already attempted in practice or purposed in law, to give a general view of law and experience in the different states, to point out educational and industrial tendencies, to consider public demands for industrial education, especially in Rhode Island, and to offer suggestions for legislative action to meet needs in this state.

The report is based on the visitation of various types of industrial schools and schools providing various kinds of industrial instruction

and training, the examination of the laws and reports of different states relating to industrial education, the findings of state investigating commissions and of special committees of industrial and educational organizations, a study of the development or history of industrial education, involving a reading of many books and pamphlets related to the subject, conferences with manufacturers and educators of this and other states, attention to investigations already made and conclusions formed by organizations and citizens of Rhode Island, and a special consideration of conditions and needs of industrial education in this state and of ways and means for its future maintenance and development. It has not been deemed necessary to repeat investigations already made, many of which have been conducted with an expense and scope beyond the means of the Commissioner. It has been assumed, in the absence of any appropriation for the purpose, that a report was to be prepared from available data, general experience and observation, and from such special investigations as seemed essential and within his means. Sufficient information is presented, it is hoped, to suggest safe and sane legislation at this time, for the promotion and maintenance of industrial education in Rhode Island.

Industrial education, as commonly understood, is in an early period of development in America. No commission attempts a conclusive discussion of it. No one assumes to speak the final word for it. Variety of law and practice, diversity in aims, plans and efforts, changing opinions, and popular confusion seem to prevail, but are normal conditions in the beginnings of a widespread national movement. In industrial education, each state must take its own initiative, determine its aims from its needs, profit by the example of others, and realize its plans in experience. There is no common pattern or standard that may be followed. In the view of many, industrial education means the establishment of a new and distinctive class of schools connected more or less closely with the existing system. In the view of others, it means an adjustment or evolution of

the public school system to meet industrial demands. Either view discloses distinctive needs in public education.

For the use of those seeking further information there is appended to the report a sketch of the history of industrial education, descriptions of typical industrial schools and a bibliography, prepared by Dr. Arthur J. Jones of the Rhode Island Normal School, who has made special investigation in vocational education, and Mr. William W. Andrew, Assistant Commissioner of Public Schools, who has had experience in practical industrial training. To them for these contributions and for other assistance, and to others for helpful information and suggestive views, due acknowledgments are here made.

II. TYPES OF INDUSTRIAL EDUCATION.

In the descriptions of various types of industrial education here given, no attempt is made to present an exact classification. In truth, there is no generally accepted terminology of the subject. In legislation and current discussion there is great diversity in the use of such terms as vocational, manual, technical, industrial and trade education. Even among educators, there is not much uniformity in the usage of terms. The present aim is to offer in general terms a brief survey of industrial education, as attempted or realized under various conditions and in connection with school systems, for a consideration of the question, what forms are best adapted to meet educational needs in Rhode Island.

The broad and popular use of the term industrial education is adopted in this report, as was evidently meant in the resolution providing for it. As thus used the term covers nearly the same field as vocational education. A classification offered by the National Society for the Promotion of Industrial Education gives five forms of vocational education, as distinguished from liberal education, namely, professional, commercial, industrial, agricultural and household. In the following descriptions, types of industrial, agricultural, domestic, and even commercial and professional education are considered.

For descriptions of examples of typical schools of industrial education reference may be made to Supplement B.

1. *Elementary Industrial Education: Manual Training, Household Arts, Etc.*—Manual training in some form is a very common subject in the elementary school. It is usually associated closely with drawing. Sometimes it is given throughout the elementary school, but often only in the grammar grades. The subject often includes such activities as paper folding and cutting and cardboard construction for the lower grades, bookbinding, weaving, work in raffia, modeling in clay, woodworking and design. This work is often taken up for purely disciplinary ends, the general training of the hand and eye; but frequently it has a distinctly industrial character, as judged by the products. Parallel with the work of boys in the upper grades are courses for girls in cooking, sewing, home decoration, etc. Usually the work in the primary grades is the same for boys and girls, while that in the grammar grades is differentiated along the lines indicated.

Shop Work for pupils above the sixth grade in elementary schools is urged by some. The plan provides that such pupils may spend a part of their time, approximately an hour a day, in a shop distinct from the school. Its aim is industrial intelligence, rather than industrial dexterity.

Factory School.—The intermediate industrial, factory or preparatory trade school is a phase of industrial education which attempts to solve the problem of the training of boys and girls between the ages of 14 and 16, years who might otherwise leave the elementary school. It has the double purpose of fitting for trade education in a trade or industrial high school and enabling them to enter the trades more advantageously. Pupils in the sixth, seventh, and eighth grades, 14 years of age, may attend such schools, which are in separate buildings, but in the school system.

2. *Industrial Courses in High Schools.*—Advanced work in manual training and domestic economy is given in many high schools. Most

high schools now give commercial courses, but the number that offer work along distinct industrial lines is comparatively small. The character of this industrial work differs with each community. Courses in printing, in jewelry and silversmithing, in designing, in electrical manufacturing, textile industries, in plumbing, in carpentry, and in many other lines are given. In a number of schools, favorably situated, agricultural courses are given or instruction is offered in subjects related to agriculture. Often botany, zoölogy, physics and chemistry are based largely on agriculture, and practical courses in agriculture, dairying, poultry raising, etc., are also given. Some of these schools give little work in agriculture, while other schools are predominantly agricultural in their tendency.

3. *Continuation Schools*.—Industrial education for people who are already at work is given in two different types of schools: the public evening schools and the various coöperative plans, where school authorities and employers work together to secure the education and training of boys who are at work.

A large part of the work in the public evening schools corresponds to that of day schools. In an increasing degree, however, various subjects and arts of a distinctly industrial character are being introduced. Plumbing, carpentry, brick laying, plastering, shop work of various kinds and many others are introduced. In fact, nearly all the industries are represented in various schools.

The coöperative plans are yet in the experimental stage and differ from one another in many respects. They agree in this, that employers and school authorities working together devise a plan by which the boys spend a part of their time working in the shop or factory under factory conditions, and part of the time in the school receiving instruction, which is largely, but not necessarily, entirely along the line of the industry in which they are engaged. A distinctive feature of the continuation school is to provide a continuance of school education of a few hours a week to children whose principal occupation is work. It is to supplement the skill of shop training with industrial intelligence, not given by shop or factory.

4. *Industrial High Schools*.—It is often difficult to distinguish between the industrial high school and the art trade school. The trade school usually admits pupils who have not yet completed the elementary school courses, while the industrial high school generally does not. The course in the trade school is often not longer than two years, while that of the industrial high school is three or four years in length, thus allowing for a higher type of work and a more general training in English, modern languages, history, mathematics and science. The industrial work varies with the needs of the community. It often includes for boys, carpentry, machinist's trade, business pursuits, etc., and for girls, dressmaking, millinery, domestic science, etc.

Related to this group of schools in vocational training is the commercial high school or high school of commerce. In public knowledge of commercial education these names fairly indicate their controlling purpose.

With these should be classed the agricultural high schools established in rural communities. In these schools courses in theoretical and practical agriculture are given and in addition a regular high school course is offered, including languages, science, history and mathematics.

Another kind of secondary industrial education, almost a distinct type, is provided in the "part-time" school, which has an illustration in Providence. The pupil divides his time between school and shop, under an arrangement between employers and school authorities. It may be distinguished from the continuation school by the fact that the controlling purpose is education rather than earning a wage.

In practice, some industrial high schools do not maintain the usual standards of admission, and therefore present phases of an intermediate grade of training.

5. *Trade Schools*.—Sometimes the trade school or, as it is often called, the industrial school, differs from the industrial high school in the requirements for admission, the length of the courses and often

but not always, in the subject offered. These schools are maintained sometimes by public, sometimes by private, and sometimes by public and private support. A characteristic of a trade school is that it aims to turn out pupils who are finished apprentices or nearly so. The course varies from one year to two or even three years. The emphasis, however, is nearly always on the training for a trade or for trades. Other studies are given, but they are largely based on trade instruction. The aim is specific training to increase the industrial efficiency of the worker, not a general education. As in other schools the dominant trades and industries of the city or community determine the work of the school. Pupils are not usually admitted under 14 years of age or below the compulsory school age.

6. *Technical, Mechanic Arts, and Manual Training High Schools.*—These three names are used for nearly the same type of school, often differing only in the amount and kind of handwork given. They do not admit pupils until they have completed the grammar school course, and they aim to give a general education, largely along the same lines as that in other high schools, but omitting Latin and Greek, and adding manual training and other forms of hand work. They do not, however, completely prepare for specific industrial occupations. They are often frankly preparatory to the higher technical institutions. Their field is entirely distinct from that of the trade school, nor would they profitably be changed into trade schools. They do not appear to occupy the same field as the industrial or technical schools of secondary grade in foreign countries. They are not primarily intended to fit the pupils for industrial leadership. There are a few schools that do have this aim. These base their work more directly on the industries and do not shape their courses as much with reference to preparation for higher technical institutions.

7. *Colleges of Agriculture and Mechanic Arts.*—These important institutions in general offer both liberal and vocational education of collegiate rank. The controlling purpose varies in different institu-

tions. If industrial education be taken in a broad sense, they offer high forms of it. They exert a strong influence on elementary and secondary industrial education.

III. INDUSTRIAL EDUCATION IN FOREIGN COUNTRIES.

The systems outlined in the following paragraphs indicate the various types of industrial education prevailing in foreign countries. Other countries, as Scotland, Ireland, Holland, Denmark, Italy, have industrial education, but present no important features differing from those described.

Germany.—Industrial education in Germany forms an integral part of the general system of education. The schools are differentiated in every possible way, in order to meet the special needs of the different classes of workers. "Joined to the general primary schools are the general industrial continuation schools, the commercial continuation schools and the countless lower trade schools. Joined to the general secondary schools are all the 'higher' industrial schools, such as the higher textile schools, higher commercial schools, higher engineering schools, and higher institutes of technology. Practical industrial experience is also introduced as an intermediate three years between the six-year *real-schule* and entry into some industrial high school. Finally, side by side with the universities, stand the great industrial high schools, the commercial, agricultural, and technical high schools." These various schools are either out and out trade or industrial schools or technical schools. There is little, if any, mixture of general education and industrial education. The schools are public, semi-public or private, as far as support and control are concerned.

England.—There is at present, no general system of industrial education in England, but there is now seen a distinct tendency in this direction. The only general opportunities offered are through the various extension courses and the evening schools. In many

places these take on a distinctly industrial character and in some cities form a very valuable part of the industrial training of the working people. Higher technical schools are maintained in some cities, notably, London, Manchester and Liverpool. These also offer opportunity for industrial or technical training to working people. In London, largely on account of the number and importance of the guilds, many polytechnic schools for elementary technical and industrial training have been established. Agricultural education is also receiving considerable attention. Agricultural colleges have been established, and agricultural education is encouraged by government grants.

France.—In France there is a well developed system of industrial and technical education, tending, as in Germany, to extreme specialization of industrial training. In general, there are the three classes of schools, the numerous schools classified as primary technical schools, the secondary technical schools, and the higher technical schools. The schools classed as primary are of very different types. Some are trade schools admitting boys or girls over 12 and under 17 years of age. The course is sometimes two or three years in length. Some of these schools admit any one over 13 years old, while others require an elementary school certificate. The secondary technical schools also include many different types. The great body of schools of this character, established by corporate bodies and private individuals, are not of as high a grade as the six national schools of arts and trades. They all tend to narrow specialization, and they usually do not admit pupils under 15 years of age. They may be considered as trade schools of a high grade. The national schools require seven competitive entrance examinations, and only those who have received a good elementary education can hope to enter.

The higher technical schools are of this same general character as the higher type of technical schools in Germany, England, and America. There are also agricultural schools of the lower and of the higher class, many of them supported by the government.

Switzerland.—Switzerland has many industrial schools of various kinds, the most important being the industrial continuation schools, the trade schools, and the secondary schools, and the higher technical schools of university grade. The instruction in the industrial continuation schools is often given during the day, as in Germany. In Geneva industrial education fits on to the class of the primary school course, where pupils finish at about the age of 13 years.

Little work in agricultural education is attempted.

Belgium.—In Belgium more than half the total number of industrial and technical schools are for girls. This is due to the practical organization of the instruction in domestic economy. Continuation schools are numerous and evening work is emphasized. The teaching of agriculture is obligatory in all the rural schools, and there are many schools in which higher agricultural education is taught.

Canada.—The Dominion of Canada presents interesting and valuable examples of industrial education, which resemble certain types found in the United States. Especially suggestive is the "MacDonald movement" for better rural education, whose purpose has been to readjust existing schools and adapt their courses to the needs of the people. It has introduced into public school education manual training, school gardens, seed contests, etc. MacDonald College contains schools of agriculture and household science that have attracted wide attention.

IV. INDUSTRIAL EDUCATION IN THE UNITED STATES.

Conditions in Rhode Island will be considered in a separate division of the report. It is the purpose of this section to present a view of what has been done in other states in respect to legislation and experience. Legislation to promote or establish industrial education is given special attention for the reason that the object of this report is to throw light on the need of legislation, and the kind of legislation needed in this state. Before the present movement for industrial education began, some elements of vocational education, from draw-

ing in school to agriculture in college, directly or indirectly encouraged by legislation and supported by state appropriation, may have been found in every state; but in general the vocational element was incidental and the purpose of school education was chiefly cultural. Differing widely from such educational experience in aim and method is the practical training for the industries that recent legislation seeks to secure. That in extent and importance the movement has become national is shown by the impressive fact that, exclusive of all other types and grades, twenty-nine states have in recent years enacted legislation with respect to practical industrial education in public schools of secondary rank alone. In the number and variety of laws, providing for large expenditures and purposing radical changes in school courses and methods, is evidenced prompt legislative recognition of the demand for industrial education.

While in no case do two states have the same laws, some similarity obtains and certain general characteristics may be observed. In all is the underlying purpose to provide industrial training. Most states seem especially to make provisions for children fourteen years of age and more, and plan training parallel with high school education. There is an evident attempt to redeem the so-called "waste-years" from fourteen to sixteen, with a less general effort to do something for younger children who are "marking time" in elementary grades and awaiting the age when they may be permitted to go to work. Various plans may indicate different ways of seeking the same end.

In those states in which most progress in industrial education has been made, the state has a large share in support and control. There appears in legislation a strong tendency in the direction of larger state responsibility in industrial education, than now generally obtains in liberal school education. It may be accepted as progressive legislative opinion that the state should take the initiative when necessary, and that it should contribute a much larger part of support and exercise a more definite supervision of industrial education than it has provided for public schools of the ordinary type. In this con-

nection attention is especially directed to the two nearest neighbors of Rhode Island. Both exemplify the principles indicated. One seeks to provide industrial education by state and local initiative, support and control. The other has established trade schools with exclusive state support and control. The part the state bears in the various plans of different states appears in the following survey, prepared with painstaking care by the Assistant Commissioner. While the list of schools given for each state is not always an exhaustive one, the endeavor has been to make it representative.

Maine.—Providing that the course of study in free high schools shall embrace natural sciences in their application to mechanics, manufactures, and agriculture, state aid equal to one half the amount actually expended for instruction, maximum annual aid, \$250; authorizing cities and towns to annually appropriate for free instruction in industrial or mechanical drawing to persons over fifteen years of age, either in day or evening schools; authorizing any city or town to raise money for support of manual training schools; appropriating \$2,000 for special investigation of the needs of the state in relation to industrial education; any incorporated academy maintaining a course in manual training, domestic science, or agriculture shall be entitled to state aid, equal to amount expended for instruction, not exceeding \$250 for each of said courses.

In 28 cities and towns free-hand and mechanical drawing is taught under special teachers; 11 cities and towns offer courses in manual training, also all normal schools; 5 cities have public school courses in domestic science. Industrial course in Westbrook High School; three academies met conditions and offered courses in manual training, one in domestic science, four in agriculture; Madawaska Training School, a state institution, has manual training courses; eleven cities and towns maintain evening schools, offering opportunities for study of drawing and manual training; Lewiston provides for an evening school for textile workers.

Vermont.—Providing state aid of \$250 for manual training departments in high or grammar schools, with total annual maximum of

\$5,000; giving the power to boards of school directors to provide for daily instruction in drawing and the industrial arts and sciences; creating a commission to investigate ways and means of improving the public schools through instruction in agriculture and mechanic arts.

Massachusetts.—Defining powers and duties and authority relative to establishment of independent industrial school throughout state, state aid equal to one half local expenditure, raised by taxation. \$2,500 appropriated for agricultural education in Normal School at North Adams; manual training, agriculture, sewing, cooking may be taught in public schools; providing that every town or city containing 20,000 inhabitants or more shall maintain the teaching of manual training as a part of its elementary and high school system; authorizing towns to maintain evening schools, course of study including industrial drawing, both free-hand and mechanical, with maintenance mandatory for cities and towns of 10,000 or more population; authorizing the organization of corporations for the conduct of textile schools, instruction in the theory and practical art of textile and kindred branches of industry, state aided; providing for the investigation of the practicability and desirability of establishing a farm school in the city of Worcester; providing for an investigation and report relative to the establishment of a system of agricultural schools.

Established four independent day industrial schools at Beverly (part time), Lawrence, New Bedford, Northampton, Montague and Newton; eleven independent evening industrial schools; state aided Worcester Trade School, Lowell and New Bedford Textile Schools, Boston Trade School for Girls, Central Evening Industrial School; Fitchburg part-time scheme; manual training in all normal schools; on private foundation,—General Electric Company Apprenticeship School at West Lynn, North Lynn, North End Union School of Printing, Boston, Fall River Ship Building Company Apprenticeship School at Quincy, Franklin Union, Boston, and others.

The Massachusetts scheme is partial state support and control. The State Board of Education may establish local schools with the consent of local authorities and appoint local committees as its agents to administer the same, or the local committee may establish the school. The State Board of Education supervises the school and approves the location, courses, methods, and expenditures. The schools are independent in that they may be administered by a separate committee or commission. Pupils above 14 not employed in any industry, pupils 14 to 18 employed as wage earners during remainder of day, and adults already employed in trades are entitled to enter.

Connecticut.—An act establishing two state trade schools; an act providing that elementary science and training in manual arts shall be taught as may be prescribed by local authorities.

Two trade schools established, one at New Britain, one at Bridgeport. Manual training courses are well developed in Hartford, New Haven, New London, Willimantic, South Manchester, Bristol, Derby, Greenwich, Naugatuck, Vernon; Yale and Towne Apprenticeship School (private) at Stamford.

Complete state support and control characterizes the Connecticut scheme of industrial education. Pupils above 14 not having become wage earners, pupils of day school above 14 obtaining part time shop practice, and others (no age limits set by statute) in continuation classes are allowed to attend. These schools have no administrative connection with public schools.

New York.—Authorizing the establishment in cities and union free school districts of general industrial schools, of trade schools, of schools of agriculture, mechanic arts, and home making, annual state aid \$500 for each approved school of above type maintained thirty-eight weeks, employing one teacher and having at least twenty-five pupils, \$200 for each additional teacher; providing that industrial training shall be furnished in every truant school.

Schools have been established under this law in Albany, Hudson,

Rochester, Schenectady, Yonkers, Buffalo, New York, Freeville and Lancaster. There are numerous schools on private foundation:—The Baron de Hirsch Trade School, New York Electrical School, New York Trade School, Hebrew Technical School for Girls, of the trade school type. Technical schools supported by private funds—Pratt Institute, Hebrew Technical Institute, Rochester Mechanics' Institute; the city of New York maintains the Manhattan Trade School for Girls, Stuyvesant Evening Trade School, Brooklyn Evening Trade School, Long Island City Evening High and Trade School, New York Evening High School for Women.

Partial state support and control is the New York scheme, the State Commissioner of Education approving the course of study. An advisory committee of men representing the industries taught are to advise and counsel the school authorities. Three types contemplated, —schools giving general industrial training, those giving trade training, those giving training in agriculture, mechanic arts and home making. Pupils 14 or a grammar graduate may attend the general industrial schools; to the trade school, pupils 16 years of age and a graduate of elementary schools or a general industrial school, with such other requirements as local authorities may establish. These schools are an integral part of public schools.

New Jersey.—Authorizing the appointment of a commission to inquire into the subject of industrial education and report thereon to the legislature of 1909; extending state aid to school districts establishing and supporting industrial education or manual training, minimum local expenditure, \$250, state aid equal to local expenditure up to a total of \$5,000; state aid to manual training and industrial school for colored youth; authorizing expenditures for buildings and issuance of bonds relating to schools for industrial education in cities of second class; providing for the establishment of schools for industrial education by boards of education, state aid equal to local expenditure, for maintenance providing buildings and grounds of \$100,000 value are given by community, maximum aid, \$10,000;

establishing and maintaining summer courses of instruction in methods of teaching elementary agriculture, manual training and home economics, appropriating annually \$2,000.

Three schools, Newark Technical School, School of Hoboken, and Trenton School of Industrial Arts established: Hoboken school in conjunction with city schools: Trenton and Newark Schools of continuation type, mostly evening instruction, elementary and secondary instruction; over 50 districts availed themselves of manual training act.

Pennsylvania.—Providing that cities of the second and third class and boroughs and townships of the first class shall have power to establish and maintain schools for instruction in the manual arts; providing upon request of 50 or more tax payers that cities shall establish night schools for manual training of children above the age of 12 years, keeping the same open as many months as day schools are kept open; providing aid for industrial schools already established.

The state has appropriated money to the Pennsylvania Museum and School of Industrial Arts; Philadelphia Trades School is maintained by the city authorities; Girard College, Williamson Free School of Mechanical Trades, Ezra F. Bowman Technical School are trade schools on private foundations; Drexel Institute of Art, Science and Industry, Philadelphia Textile School, Carnegie Technical School, Franklin Institute are technical schools on private foundations.

Maryland.—Authorizing the governor to appoint a commission on industrial education; in district schools, drawing and domestic economy shall be taught and the elements of agriculture, in the discretion of the state board; giving power to the city of Baltimore to establish a system of public schools, which shall include a school or schools for manual and industrial training; authorizing the establishment and maintenance of a colored industrial school in each county, state aid; annual appropriation of \$1,500 for manual training in MacDonough Institute, Charles County; encouraging secondary

education and extending state aid to high schools; state aid conditioned upon provisions for manual training, domestic science, and commercial or agricultural courses, approval by state board of education.

Virginia.—Providing for the introduction of manual training and agriculture in the elementary schools; appropriating \$20,000 to establish departments of agriculture, domestic economy and manual training in one high school in each congressional district increasing the appropriation to departments of agriculture, domestic economy and manual training from \$2,000 to \$3,000 each for maintenance and granting each school \$2,500 for building and equipment; allowing local boards of supervisors to appropriate money for the establishment, equipment, and maintenance of agricultural schools, provided for as above, in each congressional district.

Richmond contributes largely to the Virginia Mechanics Institute which is an institution of technical high grade; state appropriates to Virginia Polytechnic Institute.

West Virginia.—Providing that elementary agriculture shall be taught in the free schools.

North Carolina.—Providing that elements of agriculture and drawing must be taught in all public schools.

South Carolina.—Providing that the elements of agriculture shall be taught in the public schools; giving power to local authorities to establish high schools and granting state aid; said high schools are required to have instruction in manual training, especially in regard to agriculture and domestic science.

Georgia.—Empowering county boards of education to organize self sustaining manual labor schools with approval of state board of education; elementary principles of agriculture must be included in course of study in common schools; establishes high schools of agriculture and mechanic arts in eleven congressional districts, state aided.

School of Technology and Normal and Industrial College, state aided; eleven agricultural high schools in 11 congressional districts established; Secondary Industrial School at Columbus, a trade school with high school courses but no foreign language work.

Florida.—An act providing that such instruction shall be given in grammar grades in drawing, manual training, domestic arts and sciences, and agriculture as may be provided in county courses of study.

The State of Florida has established a department of Mechanical and Industrial Arts at the State University; a trade school for colored people, private foundation, known as the Fessenden Academy and Industrial School is established.

Alabama.—Establishing and maintaining agricultural schools in each of the nine congressional districts, with annual state appropriation of \$4,500 for each.

Nine agricultural schools established: Alabama Industrial School for Girls and Alabama Polytechnic Institute, state aided; agriculture a part of regular instruction in public schools; Tuskegee Normal and Industrial Institute and Montgomery Industrial School for Girls, both institutions for colored race, trade schools.

Mississippi.—Permitting separate school districts to introduce drawing and manual training in grammar school grades; elements of agriculture shall be included in subjects in curriculum of public schools.

Louisiana.—Appropriating annually \$25,000 for agricultural schools, distributed to departments of agriculture in country schools; agriculture and home economics shall be taught in elementary and secondary schools; providing that drawing shall be taught in all public schools.

Established and maintained, Louisiana Industrial Institute and Southwestern Industrial Institute, of technical high school grade.

Arkansas.—One hundred sixty thousand dollars appropriated for industrial school in each of four districts, to be known as State Agricultural School, textile manufacturing to be taught therein.

Elementary agriculture and horticulture taught in public schools; agricultural department established in State Normal School.

Tennessee.—Providing that certain percentage of general school fund shall go to high schools having a course of study requiring agriculture and home economics, to normal schools having domestic science, manual training, agriculture, and home economics; providing that elementary principles of agriculture shall be taught in secondary schools.

Kentucky.—Appropriating \$20,000 for industrial training in colored schools; providing for instruction in manual training, domestic science, and elementary agriculture in county high schools, the course of study to be approved by state board of education; school authorities shall have power to establish manual training schools and may supervise such schools in cities of first class.

Texas.—State aid by duplicating the appropriation of common or independent school districts not less than \$500 or more than \$2,000 for the establishment, equipment and maintenance of department for teaching agriculture, including such courses in manual training and domestic economy as are subsidiary to agriculture, no school to be aided more than two times; appropriations for departments of agriculture, manual training and domestic science in the state normal schools.

Oklahoma.—Providing that the elementary principles of agriculture, animal husbandry, stock feeding, forestry, building county roads, and domestic science, including the elements of economics shall be embraced in the branches taught in the public schools; creating a state commission to carry out above requirements; outlining duties of state and county superintendents; establishing agricultural schools in the judicial districts, providing that each has 80 acres of land

deeded to it without cost to state; making appropriations of \$20,000 for two schools for building; making appropriation of \$12,000 for two schools for one year for maintenance.

Ohio.—Granting authority to any board of education to establish and maintain manual training, domestic science, and commercial departments, agricultural, industrial, vocational, and trades schools, and pay the expenses of establishing and maintaining from public school funds; providing that minors over 14 and under 16 years of age who have not completed the eight grades shall be required to attend part-time classes when such classes are provided, though regularly employed.

Fifteen thousand dollars appropriated for continuation schools in Cincinnati; Cleveland established technical high and elementary industrial schools; part-time system prevails in the University of Cincinnati; a continuation school for machine shop apprentices also in the same city.

Indiana.—Authorizing the establishment, in cities of 50,000 to 100,000 population, of "industrial or manual training education and domestic science" as a part of the public school system; authorizing boards of school commissioners in cities having a population of 100,000 or over to establish, as a part of the system of public schools, a system of industrial or manual training education.

Established on private foundation at Indianapolis, the National Trade School, formerly known as the Winona Technical School; Indianapolis has established a manual training high school.

Illinois.—Authorizing referendum for establishment of manual training departments in township high schools.

The city of Chicago maintains the Crane Technical High School, the Lake High School, the Lane Technical High School, the Farragut School, the Central School. In these buildings the city maintains continuation schools and a free evening course in the Lane Technical. Lewis Institute, on private foundation, is of technical high type; Coyne National Trade School, a trade school maintained by building

trades; Lake Side Press Apprenticeship School is a trade school on private foundation. Two great correspondence schools in industrial subjects have their headquarters in Chicago: The American School of Correspondence and the International Typographical Union Course in Printing.

Michigan.—Providing for a state commission to inquire and report on industrial training, including elementary training in agriculture; establishing county schools of agriculture and domestic economy, instruction to be given in the elements of agriculture, farm accounts, manual training and domestic economy, general supervision by the state superintendent, providing for annual aid equal to two thirds of local expenditure, maximum aid to any one school, \$4,000; providing a course of study in agriculture for district schools which will fit for agricultural college; providing for the establishment and maintenance of rural high schools having a course of study in domestic science and manual training.

Eleven agricultural high schools established; one county agricultural school; 46 cities have manual training courses in the grades; three trade schools established; manual training high school at Muskegon, Saginaw, Ishpeming, Calumet, and other cities.

Wisconsin.—Authorizing the establishment and maintenance of departments of manual training in high schools and in three upper grades below the high school. Annual state aid to equal one half the cost of local expenditure for instruction, not to exceed \$350 if in high school and three upper grades, \$250 if in high school alone, maximum limit of annual state aid, \$25,000; authorizing two or more districts to unite in engaging manual training teachers and providing aid therefor; authorizing assistance of inspectors of graded schools in supervision of manual training departments; granting one half-mill tax in cities for establishing and maintaining trade schools; providing through referendum for the establishment of technical schools by cities; establishing and maintaining 10 county schools of agriculture and domestic economy, providing for state aid equal to two thirds

the amount of local expenditure, maximum aid to any one school, \$4,000; providing for teaching of agriculture in district schools.

Five county agricultural schools established; two trade schools (public) Milwaukee and one private trade school established, Menomonee; teachers training school in manual training and domestic economy at Menomonee; 28 high schools offer courses in manual training and domestic science, receiving \$8,100 from state.

Minnesota.—Establishing and providing for the organization and maintenance of county schools of agriculture and domestic science, state aid to two schools, instruction in agriculture, farm accounts, manual training and domestic economy; providing for the establishment and maintenance of departments of agriculture, manual training and domestic economy in state high, graded, and consolidated schools, state aid equal to two times the amount of local expenditure, maximum aid to any one school, \$2,500, appropriating \$25,000 for 1910, and \$25,000 for 1911; providing state aid to consolidated rural schools and requiring instruction in agriculture and home economics; state aid for agricultural extension and home education.

Ten high schools having agricultural courses, state aided.

North Dakota.—Providing for state normal and industrial school to provide instruction in manual training and to prepare teachers with special reference to manual training, state aided; providing for the government and maintenance of North Dakota Academy of Science, state aided; providing that normal schools must teach one year of elementary agriculture.

South Dakota.—Provides that one of the objects of the Northern Normal and Industrial School shall be to give instruction in manual training and also in the industrial and mechanical trades, arts and sciences and the allied branches of learning; providing that drawing shall be taught in public schools.

Iowa.—Authorizing the holding of industrial exposition by the board of any school corporation.

Nebraska.—Providing that manual training, domestic science and the elements of agriculture shall be taught and practised in the ninth and tenth grades of the county high school.

Kansas.—Authorizing boards of education in cities of first class to establish manual training high schools; authorizing boards of education in cities of the first and second class to levy a special tax of one eighth mill for the equipment and maintenance of industrial training schools or departments; other cities and districts one quarter mill. Course of study to be approved by the state board of education; report to state superintendent; state aid equal to local expenditure; maximum \$250; aggregate annual aid, \$10,000. No appropriations for 1909, 1910, 1911.

At Topeka, the Sante Fe R. R. maintains one of its apprenticeship schools.

Idaho.—Establishing high schools with a course of study which may include manual training, domestic science, nature study with elements of agriculture.

Montana.—Giving power to locate boards of education in matters of industrial education, with approval of county superintendents.

Wyoming.—Granting power to district school boards to establish and locate manual training schools in connection with the public schools.

Utah.—Providing that the board of education of county school districts and in cities of the first and second class shall have the power to establish, locate, and maintain industrial and manual training schools.

Arizona.—Instruction must be given in drawing; providing that instruction in manual training, domestic science and commercial branches may be given in public schools.

New Mexico.—Establishing departments of manual training in normal school to instruct pupils and to train teachers.

Washington.—Providing that a department of manual training shall be provided in each normal school; providing that state school system shall embrace technical schools.

Oregon.—Granting the privilege to union high schools of establishing and maintaining a department of industrial training; providing for the distribution of industrial training when required through four years in district and county high schools; requiring the state board of education so far as other duties warrant to give information and assistance in organizing and maintaining such departments.

Nevada.—Enabling school districts to issue bonds for the purpose of erecting, equipping, and maintaining buildings for industrial training, manual training, domestic science and agriculture; equipment and materials for use in manual training and domestic science may be supplied as text-books are supplied, by tax levy.

California.—An act establishing the California Polytechnic School to contribute to the industrial welfare of California, state aided; an act establishing Santa Barbara State Normal School of Manual Arts and Home Economics, state aided.

Throughout the state, instruction is required in drawing, book keeping and nature study with special reference to agriculture, and manual training and domestic science if funds and teaching force are sufficient; California has exempted from taxation the California School of Mechanical Arts, California Academy of Sciences and Cogswell Polytechnic College. Among the schools of the state which give industrial training are the Polytechnic High School at Los Angeles, a distinct trade school known as the Wilmerding School of Industrial Arts for Boys at San Francisco, private support, a distinct technical high school at San Francisco known as the California School of Mechanical Arts.

V. STATUS OF VOCATIONAL EDUCATION IN RHODE ISLAND.

To show the extent of industrial education in Rhode Island and its relation to general education, it has seemed best, in the preparation

of this section of the report to include any phase of education bearing upon industrial training and even other types of vocational education. Industrial education, in a strict or narrow sense and in a sense used by many of its advocates, has become distinctively separated from other forms of education in Rhode Island only in a limited degree.

In the drawing, manual training, and household arts of elementary schools and in many technical courses of high schools, the controlling purpose is cultural or liberal, not vocational. They are, however, a fundamental preparation for subsequent vocational training, and have appreciable value in vocational direction and in industrial education. Commercial education and the professional education of normal school and college are types of vocational training distinct from industrial education. Eliminating all types of education whose aim is chiefly cultural and all forms of vocational education not industrial, we have left a few examples of distinctively industrial education, whose controlling purpose is training for an industrial vocation.

The chief examples of practical industrial education will be found in the "part-time" course, recently inaugurated in Providence, the apprenticeship school, maintained by the Brown and Sharpe Company, forms of training in state institutions, and certain courses in the Rhode Island School of Design.

Drawing in the public schools.—In twenty cities and towns, drawing is a part of the regular course of study in the public schools. In the Rhode Island Normal School, it is a requirement for admission and is a part of the course for the training of teachers.

Manual training and household arts in the public schools.—In eleven cities and towns, manual training in some of its various forms has been introduced. In some places it is permanent, while in others, introduced as an experiment in certain schools and grades, it has been found to be so valuable and popular that further extension seems not only desirable but imperative. A brief survey is as follows:—in Newport, mechanical drawing and woodwork for boys in the sixth,

seventh, eighth and ninth grades; in the high school, mechanical drawing, carpentry, wood turning, molding, pattern making, blacksmithing, vise work, chipping and carving metals, machine tool work; in Pawtucket, grades four to seven, leather work, brass work, and simple sloyd; grades eight and nine, in six out of eight districts, bench work in wood for boys; in Providence, light constructive work for elementary grades, and bench work for boys in disciplinary school; light constructive work in schools for backward children; courses in mechanical drawing, carpentry, forging, clay modeling, wood carving, sheet metal work, wood turning, photography, steam engineering, pattern making, molding, chipping and filing, machine work and construction, electrical work in the Technical High School; in Woonsocket, sloyd for boys of the seventh, eighth, and ninth grades; in South Kingstown, paper sloyd, grades 1 to 4, and in high school mechanical drawing and bench work (wood); in Westerly, seventh and eighth grades, courses in wood work for boys; for backward children special courses in wood work; in Warwick, lighter forms of manual training and some bench work; in Bristol, Warren, Central Falls and Cranston, lighter forms of manual training in the elementary grades.

In nine cities and towns, domestic economy in some of its various forms has been introduced and, like manual training, demands further extension. A brief survey is as follows:—in Newport, cooking and sewing in the sixth, seventh, eighth, and ninth grades; in Pawtucket, grades 4 to 7, sewing; grades 8 and 9, in six out of eight districts, sewing; in Providence, in the Technical High School, cooking, sewing, millinery, and dressmaking; in Woonsocket, sewing in the seventh grade; in South Kingstown, sewing in elementary grades; cooking, sewing, and millinery in the high school; in Westerly, in the seventh and eighth grades, cooking, and sewing; for backward children in elementary grades, sewing for girls; in Cranston, Warwick, Central Falls, sewing in some elementary grades.

In certain private institutions, manual training and household arts are taught. The Tyler School and Cleary Grammar School in

Providence have well-developed courses in light construction work and bench work for the upper elementary grades. Household arts in some form are taught in twelve parochial schools in the state.

A survey of manual training and household arts in the Rhode Island Normal School is given in Supplement B., Section 1.

Commercial course in secondary schools.—Commercial courses and commercial subjects include bookkeeping, shorthand, typewriting, commercial law, commercial geography, commercial arithmetic and business practice. Partially or wholly, such courses are offered in the high schools of the state and in private schools whose purpose it is to give a strictly commercial education. In the year 1909–1910, with a total enrollment of 6,021, 22 high schools reported 1,877 pupils taking commercial subjects. Prominent among the private schools of commercial grade are Kenyon's Commercial School of Pawtucket, Bryant and Stratton's, the Rhode Island Commercial School and Max Magnus Shorthand School in Providence, and the Woonsocket Commercial School in Woonsocket. These schools report a total enrollment of 1,399 for the year 1909–1910. The Pentecostal Collegiate Institute at Scituate, Cloyne House School for Boys, at Newport, and East Greenwich Academy at East Greenwich present commercial subjects.

Public evening schools.—For the year 1909–1910, public evening schools were maintained in Providence, Newport, Woonsocket, Central Falls, Pawtucket, Bristol, Burrillville, Cumberland, Smithfield, Warren, Westerly, with a total registration of 8,207. East Providence and Johnston provided instruction in the evening schools of Providence. During this year, the State paid \$5,644.32 to these towns for maintenance of this form of education. The greater part of this instruction is in the subjects of elementary grades; Pawtucket has a special evening drawing school; Woonsocket has classes in sloyd and sewing; Cumberland, Central Falls, Pawtucket, and Providence have evening high schools; Newport presents, beside the elementary subjects, mechanical drawing, bookkeeping, free-hand drawing, short-

hand and typewriting; Providence has a technical evening school presenting courses in shop practice in machine shop, plumbing, steam engineering, jewelry, pattern making, foundry, smithing, cooking and sewing; class room work in drawing, mathematics, physics, design, modeling, and theory allied to shop practice.

Part-time work in the Providence Technical High School is described in Supplement B., Section IV.

Industrial courses in state institutions.—The Sockanosset School for Boys, with a registration of 340, maintains a kindergarten and elementary school of eight grades. A school of trades, in connection with this institution, gives instruction in printing, blacksmithing, machine shop practice, carpentry, masonry, shoe making, elementary engineering, and tailoring. A great deal of the work of the institution in these lines is performed by the students; the aim is to give a trade education.

The Oaklawn School for Girls gives elementary instruction similar to that of the Sockanosset School and presents phases of industrial and domestic training.

The State Home and School, in Providence, has a registration of 203 dependent children. It maintains a kindergarten and eight grades of elementary school instruction. Lighter forms of constructive work in manual training are a part of the course of study; bench work in wood is provided for the older boys, and for the girls domestic arts, consisting of cooking, sewing, dressmaking. Efficient home making is the aim in all of the girls' work.

The Rhode Island Institute for the Deaf, in Providence, has a registration of 76. The students are given instruction in the subjects of the common school; manual training in cabinet work for older boys, sloyd for the younger; mechanical drawing for all. The girls receive instruction in sewing and cooking.

In the Rhode Island School for the Feeble-Minded the activities of the inmates are largely physical, including games and shop, domestic and farm work. In institutions of this class, reading, writing and other school subjects and arts are taught, but even mental

training is sought chiefly through motor activity. Such experience has little significance in productive industrial education, but attests, in a peculiar manner, the value of manual training for self-control, self direction, and personal efficiency.

Rhode Island State College.—A function of this institution is to aid in fostering the industrial life of the state, with special reference to agriculture, manufacture, transportation and home making. Related to cultural, or liberal education, it offers organized courses, which are vocational in aim, in agriculture; in mechanical, electrical, chemical, and civil engineering; in home economics; and in teaching, for those who are preparing to give instruction in applied science. The college also offers short courses in the same subjects. In its experimentation the institution pursues investigation for the discovery of truth applicable to agriculture and industries. Through the agency of its extension department, it extends its work to various parts of the state.

Rhode Island Normal School.—Professional in aim, this institution offers a distinctive type of vocational education. The state maintains and directs it with the single purpose of preparing teachers for the public schools.

Rhode Island School of Design.—The Rhode Island School of Design purposes to instruct artisans in drawing, painting, modeling, and designing, that they may successfully apply the principles of art to the requirements of trade and manufacture; to train students in the practice of art that they may understand its principles, give instruction to others, or become artists; to give general advancement to art education by exhibitions and lectures.

The school offers diplomas in eight departments:—free-hand drawing and painting, decorative design, modeling and sculpture, achitecture, mechanical design, textile design, jewelry design, and normal art. Besides the regular diploma courses, there are teachers' Saturday classes designed for teachers of private and public schools to assist them in preparing for their school work of the coming week.

These classes offer, also, to young people an elementary art training. Evening classes are maintained in free-hand drawing and painting, decorative design, modeling, architecture, mechanical design, textile design, jewelry design. A summer school in 1910 offered metal work for teachers of grammar and high schools, jewelry and silversmithing, theory of design, practical design, out door sketching, manual training for elementary schools, and wood working.

Brown University.—Brown University furnishes vocational education of collegiate rank in courses in free-hand and mechanical drawing, chemistry, civil, mechanical, and electrical engineering, economics, engineering geology, mechanics and teaching.

Pentecostal Collegiate Institute.—The Pentecostal Collegiate Institute at North Scituate not only gives elementary and secondary instruction but also offers elements of mechanical and electrical engineering for men and household economics for women. In connection with the institute is the Pentecostal Trade School. At present, there is established a broom shop for boys; power sewing machines have been installed for the manufacture of babies' bonnets, ladies' scarfs, canvas gloves, etc.,—this work to be done by the girls.

Saint Andrew's Industrial School.—Saint Andrew's Industrial School at Barrington, offers, in addition to regular academic courses of instruction, printing, carpentry, and farm work.

Apprenticeship School of Brown and Sharpe Manufacturing Company.—A school of apprentices is maintained by the Brown and Sharpe Manufacturing Company in its works in Providence. This school admits boys between the ages of 16 and 18 years. The course consists in practical shop training in the technique of different machines and operations, assembling, and erecting. The term of trial is twelve weeks, at the termination of which if satisfactory, fees are paid and agreements signed. Courses are offered in machinist trade, pattern making, molding, each of four years' duration; and of

core making and blacksmithing, each three years in duration. The aim in each course is to give thorough instruction in every branch of the trade and to turn out all-round mechanics. The working hours are the same as the full schedule of regular workmen.

Besides the practical training in the shops, the boys who are apprentices in the machinist, pattern making, and blacksmithing trades receive instruction in the class room in the solution of practical shop problems, such problems having been selected from those which have actually occurred in connection with shop work. These problems have been arranged in a progressive course of lesson sheets, which as nearly as possible coincide with their progress through the shops. During the first two years of apprenticeship, the boys are given one period of two hours per week and in the third and fourth years, two such periods per week. During July and August, no class room sessions are held. The time spent in the class room is during working hours, is paid for at the same rate as other service, and counts as a part of the term of apprenticeship. The class room work is not divided into formal academic subjects and given as such, but is instruction in mathematics, drawing and allied subjects presented as they grow out of shop practice.

School of Salesmanship.—The Providence School for Salesmanship controlled and maintained by some of the leading department stores, was in session during the year 1909–1910. It offered a course in salesmanship to sales women employed by the firms supporting it. The work covered instruction in the art of selling, knowledge of stock, manufacture, quality, design, colors, business arithmetic, store practice, personal hygiene, and allied subjects. Students were excused, with pay, for the morning period of instruction.

VI. DEMANDS FOR PRACTICAL INDUSTRIAL EDUCATION IN RHODE ISLAND.

Without question there is an earnest and extensive demand for practical industrial education in this state. The widespread agita-

tion of the past five years has been manifest here as elsewhere. Many associations representing our educational, industrial, commercial and agricultural interests have given prominent attention to the question in this discussion and with noteworthy unanimity have urged the introduction of industrial education into the public schools or the establishment of industrial and trade schools. The expression of the demand for legislation is perhaps less pronounced in this state, because any city or town is already free, without legislative action, to take the initiative in adding industrial courses to the school curriculum. There is, however, a growing recognition of the need of state initiative, support, and direction, to secure the best results. For this reason, if not soon supplied, the demand is likely to be expressed with more insistence and more exacting terms. More and more are citizens inclined to look to the General Assembly for action.

To indicate in some degree the trend of public opinion and to show the character of the public demand in Rhode Island for industrial education, the following paragraphs are presented.

Recommendations of the State Board of Education.—As its reports show, the department of education has long recognized industrial needs in public education in this state and has observed with sympathetic interest the growing public demand for industrial education. From time to time it has called attention to the matter and suggested that legislative action was warranted on the investigations already made and the conclusions already formed. In the Board's report for 1906, appears the following paragraph on "Industrial Education."

"The signal awakening of public interest in industrial education, in all parts of the country, prompts more careful attention to the industrial and commercial needs in our own State. Thorough investigations made elsewhere in New England seem to indicate that, if we are to maintain our position in our well established industries, our coming workmen must receive a better training for trade and manufacture than that afforded by existing agencies. In truth, there is already a strong demand for trade schools, supported at public expense. The opinion of manufacturers, industrial leaders, and eminent educators, as well as the action taken by some states and

municipalities to establish public schools for more efficient industrial education, inspires the belief that serious consideration should be given to the future industrial needs of Rhode Island with a view to proper and timely legislation."

Industrial Education Conference.—Following a period of live public discussion and increasing public interest, a conference on industrial education was held in the rooms of the Providence Board of Trade early in 1909. Attending this conference were representatives of twenty-two leading educational, social and industrial organizations. Educational and social interests were represented by committees of the Rhode Island Institute of Instruction, Barnard Club, Providence Public Education Association, several teachers' associations, Rhode Island Federation of Women's Clubs, Consumer's League of Rhode Island and similar organizations. Various interests of industries were represented by committees of such organizations as the Providence Board of Trade, New England Manufacturing Jewelers and Silversmiths' Association, Rhode Island Metal Trades Association, Rhode Island Chapter, American Institute of Architects, Rhode Island Business Men's Association, Rhode Island Association of Working Women's Clubs, Builders' and Traders' Exchange, and Providence Society of Mechanical Engineers. The practical result of this conference was the appointment of an executive committee to take necessary steps to apply to the General Assembly for desirable legislation on industrial education. Subsequently a conference was arranged with members of the State Board of Education, in response to the following resolution:

"*Resolved*, That the State Board of Education be asked to co-operate with the Industrial Education Conference in securing legislation providing for (1) state aid for cities and towns in establishing and maintaining courses and schools for industrial education; (2) the appointment of a state director of industrial education, who, under the direction of the Commissioner of Public Schools, shall promote the interests of industrial education in this state."

At this conference, held in the rooms of the State Board of Educa-

tion on March 10, 1909, the needs of industrial education in Rhode Island, the character of legislation needed, and methods of state and local administration were discussed at length by representatives of various interests. As a result of the hearing, a statement expressing the conclusions of the Board of Education was communicated to the Industrial Education Conference Committee, as follows:

"1. That the Board approves the efforts of the associations represented by the Industrial Education Conference for the more efficient industrial education of our youth.

"2. That, in accord with principles and practice already established in law, the Board believes that the state should share with towns and cities in the support and direction of industrial education, as it does in the support of evening schools, libraries, supervision, et cetera.

"3. That, therefore, the Board approves proper legislation to encourage and aid the establishment and maintenance of industrial courses.

"4. That the Board recognizes the need of an assistant to the Commissioner of Public Schools to insure the desired promotion of industrial education on the part of the state, and will approve proper legislation for meeting such needs.

"5. That the Board will appoint its President and Secretary as its representatives in this matter."

Proposed Legislation of 1909.—Presented as a sound proposition for initial legislation and embodying the conclusions of the Industrial Education Conference of that time, a bill, entitled "An Act to furnish state aid to cities and towns which provide for industrial education," was introduced in the House and referred to the Committee on Education. At a public hearing before the Committee arguments for the measure were presented with clearness and force, and no active opposition was offered. While the desirability of such legislation seemed generally acknowledged, perhaps the feeling that the time was not yet ripe for it, or the fear that it might involve a greater expense and responsibility than the State was prepared to assume, prompted a postponement of its consideration to a more favorable time. The

bill is given below and indicates what was asked of the General Assembly two years ago.

"SECTION 1. Any town which establishes and maintains day or evening courses for industrial education, including instruction in the principles and practice of agriculture or the domestic or mechanic arts, which courses are approved as to equipment, instruction, expenditure, supervision and conditions of attendance by the state board of education, shall be entitled to receive aid from the state in support of such courses to the amount of one half of the entire expenditure for the same. The cost of new equipment may be included in this reckoning, but not the cost of buildings or of land or of rent of rooms. This section shall not be construed to entitle towns to receive state aid for manual training high schools, or other secondary schools maintaining manual training departments, except in so far as such schools include courses properly classed as industrial courses.

"SEC. 2. All applications for aid under this act shall be made to the commissioner of public schools by the school committee of the town; and said application must be accompanied by a statement setting forth the facts relating to equipment, instruction, expenditure, supervision and conditions of attendance which are made the basis of the application.

"SEC. 3. There shall be elected by the board of education a deputy commissioner of public schools, who, under the direction of the commissioner of public schools, shall promote in all desirable ways the establishment and efficient management of courses for industrial education in practical arts and agriculture, as contemplated by Section 1 of this act; and otherwise assist the commissioner of public schools in the discharge of his duties.

"SEC. 4. The state board of education shall fix the salary and term of office of the deputy commissioner of public schools. The sum of two thousand dollars or so much thereof as may be needed is hereby appropriated for the payment of said salary and incidental expenses connected with said office for the balance of the fiscal year of 1909. The state auditor is hereby authorized and directed to draw his orders on the general treasurer for the payment of the same, out of any monies in the treasury not otherwise appropriated."

The Rhode Island Institute of Instruction, whose membership includes nearly all the teachers of the State, adopted at its annual meeting of 1910, the following resolution:

“Resolved, That this Institute urges the General Assembly to enact legislation providing for the establishment, in such sections of the state as seem best adapted to the purposes, of public day and evening schools which shall give instruction in the arts and practice of trades to persons who have attained the age of fourteen years, and that the Committee on Legislation are hereby asked to use their influence to this end.”

In 1910 legislation authorized the appointment of an Assistant Commissioner of Public Schools. Should the General Assembly enact provisions for industrial education in the State, the services of the Assistant Commissioner would be available to assist in carrying out the purposes of such provisions.

VII. NEEDS AND OPPORTUNITIES OF INDUSTRIAL EDUCATION IN RHODE ISLAND.

Whether expressed by employer or employee, by educator or citizen, the demand for the study of industry and industrial training in school comes from the needs of productive industries. Formerly the shop of a few employees asked little of the school, because its system of apprenticeship, with its personal relations, was adequate to train workmen of intelligence and skill. Now, wherever shop and factory employment has become highly specialized, the system of apprenticeship fails to develop efficient workmen. Many employments have ceased to be educative. Employers of labor tell us that the lack of industrial intelligence among workmen bars them from progress and lessens industrial productiveness. They confess that factory and shop can no longer make good workmen without the aid of school instruction adapted to the needs of workmen. To meet this need, a very few great manufacturing establishments have instituted schools of their own, which ordinarily provide not only practical training but also special instruction related to the industry involved.

The Brown and Sharpe Manufacturing Company of Providence maintains in its apprenticeship school, described in section five, an excellent type of industrial education. A similar school is maintained by the General Electric Company in Lynn, Mass. Such examples are a recognition of the value of industrial education, and emphasize the educational needs of industries. Evidently only large corporations can afford to maintain industrial schools for their apprentices, and the needs of smaller manufacturing units will continue until public school education supplies relief. It has no little significance that a grave need in public education seems to have been discovered in shop and factory, and that they not only report such need but offer coöperation in providing a remedy. It means that factory and shop may become closer allies of the school as educational agencies.

An examination of industrial conditions and needs reveals a peculiar element in the educational problem of the industries, that industrial education must be adapted to local requirements. In public education the school in some degree reflects local life and offers optional courses in high schools, but for the most part our public schools give the same instruction to all children of a community and of different communities. Such general plan may serve the purpose of manual training and other cultural school arts, which have vocational value, but can in no way meet the needs of industrial education. The true industrial school will best serve its community by taking the hint from neighboring shop and factory. It must adapt its instruction to local needs. Instruction having wide application will, of course, become general; but much special school instruction and practice will be required to meet the needs of various industries.

Many thoughtful citizens believe that, if America is to maintain her present position, or seek to improve it, in productive industries, there is imperative need of the development of an efficient system of industrial education. That Rhode Island has no less need than other states in this direction is shown by the large per cent of her popu-

lation engaged in productive industries. In truth, it hardly needs to be pointed out that, if a public system of industrial education is needed anywhere, it is required in Rhode Island, because of the variety and extent of her industries, her leadership in certain great manufacturing interests, her concentrated population, and the excessive number of her people employed in shop and factory. That this need is recognized not only by leaders of industry but also by public-spirited citizens has been indicated in the preceding section.

Agriculture in its development of recent years also presents educational needs of its own. Changes in methods, machinery, marketing, and class of workmen, as well as more scientific practice and tendency toward intensive farming, are calling for a public education that shall supply, more effectively than it now does, the needs of agricultural pursuits and justly serve the great public interest of agriculture. The fact of such need has long been recognized, as evidenced in the addresses and resolutions of farmers' institutes and grange meetings.

Industrial commissions of investigations in other states report conditions and needs similar to those in this state. While these commissions recommend various remedies, they agree substantially in a recognition of the need of industrial education. A suggestive example of such general verdict is a summary of the results of an investigation made in New Jersey, which follows:

"(1) As the direct outcome of modern industrial conditions—factory organization, the introduction of machinery, and "piece-work"—the apprenticeship system has been virtually abandoned as a means of instructing the young in the various trades. (2) There is a lack of skilled and efficient workmen, and this will be largely increased unless a better means of vocational training is found. (3) Although the compulsory attendance period in the public schools has been gradually extended, the schools have not been able to offer vocational training. Fully ninety-five per cent of the pupils leave school between the ages of fourteen and seventeen, and without having formed any idea as to what trade or vocation they should follow; in consequence, they drift into occupations, rather than select those which might be most nearly suited to their aptitudes, and their progress is generally arrested at an early age, because of the

restricted character of their experience, and the failure to receive supplementary instruction. (4) The trades have become so specialized that there is but little chance for a learner to go beyond the narrow limits of the work to which he is assigned, unless he has supplementary training. (5) The workers, mechanics, or craftsmen in the several trades are deeply sensible of their lack of opportunities for vocational training during the early years, and grown men among them would gladly take advantage of industrial schools, if these institutions were established. (6) Although business conditions are such that the employers, in most instances, have neither the time nor the inclination to conduct vocational school within the factories, they would gladly welcome any suitable means of providing the workers with the instruction which the latter require. (7) There is an urgent demand for facilities for industrial education to supplement the training of the shops."

The need of industrial education is felt not only in the shops and on the farms, but in the schools of the State. Public education should be dominated by the vital interests of society rather than by tradition. Itself a part of social and industrial life, the public school must adjust itself to changing conditions and respond to new economic and social demands. In its training for citizenship, it must realize that efficient citizenship includes industrial or productive citizenship. If Rhode Island is to provide efficient industrial education, not only must distinctive industrial courses and schools be developed, but the whole school system must provide an elementary training to serve as a suitable basis or preparation for subsequent industrial and agricultural, as well as commercial and professional, education. In a broad view, the primary element in public industrial education, though not the need felt acutely, is the proper elementary training of children who are to enter industrial occupations. Efficiency in many pursuits is more or less dependent upon early training, for example, in drawing and other manual activities. Industrial and social intelligence in the school but makes it more effective in civic education. An enrichment of school studies and activities to meet general industrial requirements in no way makes the controlling aim of the school vocational; but implies that vocational intelligence and direc-

tion have value in cultural or liberal education and are vital elements in public school education for American citizenship. Following such elementary education and resting upon it, special industrial courses in existing schools and special industrial schools may best be developed and maintained. Whether courses and schools, distinctively industrial, are to be established as a permanent part of public education, it yet remains that elementary school education needs to be rectified and enriched by larger elements of manual training and industrial intelligence.

For the establishment and maintenance of an efficient system of practical industrial education, Rhode Island has peculiar advantages. Her very limitations of territory, her density of population, her immense wealth, her commanding industrial intelligence, her superior standards of skill in trades and manufactures, her highly developed system of public education, her power of coöperative organization, and her essential progressiveness give her unexcelled opportunities to realize in educational experience the very best forms of industrial instruction and training, already conceived or hereafter to be evolved. Neither school nor shop offers any serious difficulties to the introduction of practical industrial training into public education. The problem, though perplexing and supremely important, is susceptible of practical solution through wise legislation and administration. The first legislative steps to its solution may safely be taken in the light of present knowledge and experience, and directed by public needs.

Among opportunities, the way seems clear for the extension of forms of industrial education already established, to other schools and communities, the establishment of new industrial schools, and the introduction of industrial courses into high schools in response to definite local demands. Industrial courses in high schools would but follow commercial courses, introduced long ago. The inexpensive arrangement of the part-time plan, provisions for continuation schools, and especially the extension of manual training and industrial

intelligence in the elementary schools are all open ways of opportunity.

The attitude of manufacturers and other employers of labor toward industrial education, as shown elsewhere in this report, their willingness to coöperate with school authorities, and their knowledge of needs are an advantage of the utmost importance. Effective coöperation between shop and school in trade and industrial education means the larger use of shop with its equipment, in lieu of a school-shop. To build school-shops and equip them with machinery adequate to meet all the needs of trade education would obviously incur enormous expense. Furthermore, it is held by many that the school, however well equipped, cannot alone, without the coöperation of the shop and factory and of trades, provide efficient training for workmen. To reproduce in school actual industrial conditions and operations is extremely difficult. The advantages to the apprentice are clearly apparent when he receives his practical training in the industry itself and receives from the school related instruction for the industrial intelligence that the school can give and the shop cannot, except in exceptional cases. Not only economy but efficiency calls for coöperation between school and shop, the one to become more industrial, the other more educational. Here appears the reason why so many claim that successful industrial education must be directed both by representation of the industries and by school authorities. There appears to be but little confidence among employers that the school has the willingness or ability alone to provide just the industrial education that is needed by workmen in their industries. On the other hand, there is a fear among some educators that public education, dominated by industrial demands, may be directed to serve trades or industries rather than the public's children and youth, and thereby lose something of its power to train them for a broad American citizenship, from which avenues should lead to all vocations. It has already been pointed out that it seems possible, and is expedient, to provide better civic education through the very means of industrial intelligence and manual training, and to promote a more efficient

citizenship by extending vocational public education to serve the great public interests of agriculture, trades, and industries.

Because of the advantages of coöperation between school authorities and employers and for reasons already given there seems much hesitation before any proposition to establish a pure type of trade school, supported wholly at public expense and directed by school authorities. For coöperative plans, industrial courses, continuation schools and other plans, it is believed that there will be prompt public response to legislative action.

This state has another advantage for the development of industrial education in her institutions capable of training teachers and supervisors for such work. To secure efficient teachers for new forms of instruction and training is always a serious difficulty. Already the Rhode Island Normal School, in regular courses and Saturday extension classes, is preparing teachers for manual training and household arts. By means of a summer session it may give such training to large numbers of teachers in service. The Rhode Island State College provides a preparation for teachers of agriculture, home economics, and mechanic arts. Brown University offers a technical education in its scientific departments applicable to many industries. The Rhode Island School of Design presents many courses related to industrial education, and in its work has done much to prepare the way for the introduction of useful arts into the public schools. It is believed that graduates of these and other institutions, also trained in the experience of shop and factory, are available as teachers and supervisors for industrial instruction. Certainly they may provide for future needs when those needs are known.

In these opportunities for industrial education in Rhode Island appears a distinctive economic advantage. Probably nowhere else can adequate industrial education be provided at less expense. Our concentrated population, the willing coöperation of employers, and our institutions for the preparation of teachers, make it possible to establish industrial education at minimum expense. As no other state has greater need of industrial education, so no other state has better opportunity for establishing and maintaining it.

VIII. AIMS IN PUBLIC EDUCATION.

In the preceding pages of this report the facts of industrial education have been arranged and presented with the hope that they might indicate what legislation relating to industrial education is advisable in this state. In keeping constantly in view the industrial aim, the broader aims in education may not have received full recognition. The general purposes of public education are paramount, and provisions for the special element of industrial training may most wisely be made with due regard for our entire system of education, which had its beginnings with the State itself. To conserve and strengthen public school education for its broad purposes, as well as to meet special needs, should be the aim of any legislation for industrial education.

The broad aim and recognized function of public school education has been a preparation for intelligent citizenship, such education being supported by government as the safeguard of civil rights and political institutions. Such aim does not necessarily exclude the narrow view of the parent, that education is to prepare children to earn a living, or of the employer, that education is to train children for efficient work. Most criticism of the school is for its seeming failure to fulfill the narrower purposes; but formerly education was not supposed to train a workman, but to make a workman intelligent. Now the school is asked to help train the workman for productive efficiency. In responding to this new public demand, the broad purpose of school education is not to be supplanted by a narrower aim, but energized by new life. The school is to educate better citizens by training better workmen; but the making of good citizens is still the chief business of the school.

To meet new social and economic demands, no radical change, but gradual evolution, in our school system seems necessary. To supply the pressing needs of industrial education, our schools must be modified and supplemented, just as they have been in the past, to respond to new needs. It should not be forgotten that the school has always

made for intelligence, even industrial intelligence. "A command of English, a command of numbers, and a command of drawing are tools of every workman's trade." It is well to remember that our public school system is a constituent part of our civilization, and itself is animated by American intelligence, energy and practical sense. Properly modified and supplemented, it can and will assume its newer duties of industrial education, when so directed by the public will and necessary means are provided for such end.

IX. SUMMARY OF OBSERVATIONS.

The foregoing considerations seem to justify the following conclusions:

1. That twenty-nine states have enacted laws to establish and maintain industrial education evidences a widespread demand for more efficient workmen in productive industries. The movement is worldwide.

2. The apprenticeship system no longer trains intelligent and skillful workmen. Specialization in modern industry does not make for industrial intelligence. The workman's progress is barred by lack of vocational training, which shop or factory can rarely give; and productive efficiency in industries is lowered.

3. A remedy is sought in public vocational education. Schools of different aims and kinds have been established and are supported and directed in various ways.

4. In the establishment of industrial education, there are two general lines of effort: one, to modify existing schools for industrial instruction; the other, to establish a distinct class of schools for the same purpose. Each may need the coöperation of employers.

5. In the variety of law and practice some general characteristics may be observed. All industrial schools have the same underlying purpose. Provisions are chiefly made for children above the compulsory school age, evidently to redeem the "waste-years" from fourteen to sixteen, and to less extent for younger children "marking

time" in elementary grades. To adapt industrial instruction to local needs is general.

6. For efficient industrial education it is generally accepted that the state must assume a larger share of support and direction than obtains in general public education. That the state take the initiative not only in legislation but in organizing schools is generally recognized as necessary. Industrial education seems regarded by legislators in many states as a great public need, demanding the immediate attention of the state.

7. Public education in Rhode Island is chiefly liberal or cultural in its aim. It offers several examples of vocational preparation, but presents few types of practical industrial training. It does not meet the needs of modern industrial organization.

8. There is a strong demand in Rhode Island for industrial education. Examination of conditions discloses as great need in Rhode Island as elsewhere. Needs, demands and opportunities justify legislative action.

9. The demand comes not only from the progressive industrial leader but also from the practical educator, one seeking more intelligent workmen, the other seeking a better education of youth. Both tend to the same end, to strengthen a weak part in public education.

10. The general purpose of public education may include industrial aims. Schools need only to be modified and supplemented to meet the just demand of industry.

11. The schools will respond to new social and economic demands when the public so direct and provide necessary funds.

12. Effective legislative action would give an impetus to the development of industrial education in Rhode Island.

13. The state may promote industrial education along two lines (1) to improve elementary education by encouraging manual arts and industrial intelligence, and (2) to meet industrial needs by co-operating with local school authorities in establishing and maintaining industrial courses and schools. Generous state aid is essential to secure immediate and substantial results. For the first object

indicated, state aid may be rendered for equipment, following precedents in this state. For the second purpose, experience in other states suggests that it be given for special industrial instruction.

14. The proposed legislation of 1909 embodied sound principles and safe practice in state educational administration.

15. The state may wisely make general provisions for the support and supervision of industrial education and entrust to towns and cities the choice of special types of schools or courses best adapted to their needs. Such types may include elementary industrial education; continuation and industrial evening schools; agricultural and industrial courses in high schools; industrial or agricultural high schools, to be established by city or town or by a union of towns. Part-time arrangements do not seem to need state aid. In all elementary schools, manual arts should be promoted; and nature study, school gardens and a study of agriculture should be encouraged, especially in rural schools.

16. The time does not seem ripe in Rhode Island for the establishment of state trade schools. It is doubtful whether it will ever assume the responsibility and expense involved in such venture for vocational education.

X. RECOMMENDATIONS.

In compliance with the provisions of the resolution authorizing this report, the following suggestions for desirable legislation are presented for consideration:

1. State aid for equipment in manual training, household arts and school gardens, corresponding with aid already given for similar purposes, to encourage elementary industrial instruction.

2. To provide additional state support to evening schools that offer industrial courses.

3. To encourage the establishment of continuation schools with the coöperation of employers.

4. To promote the introduction of industrial and agricultural

courses into existing high schools, the state to share in determining proper courses and in defraying the expenses of special instruction.

5. To offer state coöperation and support to towns and cities for the establishment of industrial high schools, or of schools related to this class.

6. To carry out one or more of these purposes, legislation is essential to safeguard the interest of the state in the following particulars: state approval of courses and schools; properly certificated teachers; required number of pupils to warrant state support; limitations and applications of state aid; and perhaps ways and means to promote industrial education on the part of the state. The suggestions given have one general purpose, to provide state support and coöperation and leave to towns and cities the opportunity to determine the kind or kinds of industrial education they need.

APPENDIX.

SUPPLEMENT A

A HISTORY OF INDUSTRIAL EDUCATION

BY ARTHUR J. JONES, RHODE ISLAND NORMAL SCHOOL

Industrial training is as old as industry itself, but industrial education is of very recent origin. Industrial education, as the term is used to-day, refers to training or education along industrial lines which is given, not in the shop itself, but in an institution more or less separated from the shop.

In the time of ancient Athens there were many people engaged in industrial occupations of various kinds. From the specimens of their work which have been found, we know that many were very skillful. At that time the secrets of each particular industry were handed down from father to son, and no attempt was made to give any general training along industrial lines. Athenian citizens seldom if ever were engaged in these occupations, for such work was considered to be degrading. Aliens residing in Athens and slaves performed practically all of this kind of service. Yet, even for the Athenian boy, there were many opportunities in his daily life for acquiring those manual and industrial elements now found only in industrial occupations. Girls received their training at home in cooking, sewing, spinning, weaving, and all the other arts of the housewife.

The schools, meanwhile, were devoted to purposes far removed from these. They offered instruction in language, literature, mathematics, and some science, to those who never intended to enter industrial occupations. On the one hand, they were intended to give such training as would enable one to spend pleasantly and profitably

the leisure time of life, when it was not necessary to be engaged in any kind of work. This developed into an education merely for the leisure class, those who did not need to work. Hence any training of an industrial character would defeat the end for which the education was provided. Again, the general system of education provided a training for those who were intended for the so-called "higher" occupations, such as that of the statesman (or politician), the orator, later the lawyer, the physician, the clergyman; all these needed more training in different departments of language and in abstract thought than did those who entered industrial occupations.

This fact must also be kept in mind, that industry was based not on science as now but on experience, *i. e.* the facts of industry were discovered largely by accident and handed down with little or no attempt to discover the underlying laws or to work out general scientific principles. Science, among the Athenians, arose in response to the demand of the leisure class for the discovery of new things, of the underlying causes of things; it was thus closely linked with philosophy. It is only comparatively recently that science has been harnessed to industry.

Thus the trade and the school, as science and industry, grew up as distinct parts of social life, and industrial training and education were thought of as entirely separate. This was especially true during the best days of Greece and Rome.

The learning of the Greeks and Romans and their great skill in industry were all but extinguished by the onrush of the barbarian hordes that came down from the north and overran and overthrew the weakened Roman empire. It is to the monasteries that we owe not only the preservation of much of the classical learning but also the secrets of the skilled industries. During these troubled times the monks were practically the only skilled artisans. Connected with many of the monasteries were shops or stalls for workers in metals and leather, blacksmiths, carpenters, masons, and all other kinds of skilled workmen. These monks not only did most of this kind of work, but also taught the secrets of the industry to others, laymen.

The great commercial and industrial development of Europe immediately after the Crusades produced great changes in industrial life, which in turn influenced general education. Cities grew up rapidly and became independent. Merchants and traders grew wealthy and gained greater power than ever before. They began to make demands on the schools, both for more schools and for a more practical education. This resulted in the substitution of the mother tongue for Latin as the basal language in many schools, and in the establishment of schools where such practical subjects as commercial reckoning and commercial writing were taught. Guilds of skilled workmen were formed which systematized and controlled the work of the apprentice and made of it a very valuable industrial training. These guilds grew up in all the European countries and have had a very great influence on the development of industrial education. In Germany especially, and also in London, they have been continually active in this direction.

The apprenticeship system of training for industries seemed to be sufficient for the first stage in the development of industry, the stage of handicraft, in which there were a small number of master craftsmen, each of whom had a few journeymen and apprentices, and in which each worker produced the complete article. Very soon, however, new explorations, increased facilities for transportation, the rapid increase in urban population, and other changed social and economic conditions, resulted in new and increased demands on industry. The handicraft stage gradually changed to the stage of manufacture in which there were grouped together numbers of workmen who produced the complete article by a division of labor, each doing a part. It was more economical of time and energy for each worker to specialize on one part of the product. There was no longer the same necessity for each worker to know how to make the complete product. Competition was keen and success depended not only on the quality of the product but on the quantity produced and on the rapidity of its production. A different type of training became necessary. The exigencies of industry left the master workman less time to devote to

the training of his apprentices. As a consequence, the apprenticeship system no longer provided as thorough an industrial training as formerly.

Finally has come the stage of modern industry, in which the article is produced by machinery driven by power and in which the duties of the worker are limited to superintending and correcting the performances of the mechanical agent.

Both of these changes in industry have profoundly affected the training of industrial workers. An altogether different type of education and training is necessary from that of the older time. Changed conditions, especially the introduction of machinery, have relegated to unskilled labor many activities which formerly required skilled workmen, and the work of the skilled laborers has constantly changed in character. Now it frequently or nearly always requires a higher type of training or skill than formerly. Hence has come about the great and pressing need for some adequate provision for the training of our industrial workers in all varied lines of industry.

Recently the demand for industrial education is making itself felt from an entirely different quarter. The modern home no longer furnishes the industrial and manual training given formerly in the home. The demand is becoming more and more insistent that it is the duty of the school to furnish to rich and poor alike these industrial elements which we now consider so important an element in all education.

GERMANY.

The German people have always been famed for their industrial and commercial ability and enterprise. Their ambition has been largely along the line of commercial and industrial supremacy. These forces worked together for centuries, but were held in check by obstacles against which no other nation has had to contend. Before the time of the unification of the German empire in 1871 the country was but a loosely jointed confederacy with no unified administration and no common purpose. Each principality or kingdom was a law

unto itself. The energy of the people was dissipated in petty struggles and disputes over multitudinous internal customs and duties. Several attempts were made to remedy this condition but with only partial success.

When the empire was established these conditions were changed. Germany had a strong centralized government which was able to unify and coördinate all her forces. At the same time her military success made her conscious that she was a world power and by securing political freedom set loose all the latent forces which had hitherto been repressed by adverse circumstances.

Very early the German people recognized that schools for technical and industrial training were the means by which industrial and commercial supremacy could be best accomplished. In the eighteenth century there were a number of industrial or trade schools for the training of workers in various trades. These were all very elementary in character and aimed merely to supplement the training given to the apprentice by the master. In the beginning of the nineteenth century these trade schools increased in number and in importance, largely on account of the change in industry already noted. Among these were schools for instruction in the mining, the textile, and the building industries. Training of an industrial character was sometimes given in connection with the Sunday schools, which had long been established. These had increased in number and, instead of instruction on Sundays, held their sessions mostly on weekday evenings. Since the pupils who attended these classes were almost entirely engaged in industrial occupations during the day, it came about that special emphasis was placed on certain subjects other than the usual school subjects. Thus grew up "drawing schools," "merchant schools," "trade schools," "commercial schools," etc. Thus these schools gradually took on the character of industrial schools and to-day form a very important part of the system of industrial education.

Another type of school which has greatly aided Germany in the establishment of industrial schools is the "real" school. These

schools in their earlier stages attempted to combine general and industrial education in the same institution by associating special trade courses with general educational courses. The first institution of this kind was founded about the middle of the eighteenth century but was shortlived, largely because it attempted to cover too much in its courses. The plan as outlined was "to offer instruction in everything and to everybody, including the learned man, the official, the mechanic, the merchant, the miner and the agriculturist."

At the beginning of the nineteenth century a number of technical "high schools" or colleges which later developed into engineering schools were established, thus affording technical training of the highest type.

For the reasons that have already been noted these industrial schools languished during the first part of the nineteenth century. The various types of schools were, however, gradually taking form and adjusting themselves to new conditions.

The first great "World's Fair," held in London at Hyde Park, in 1851, opened the eyes of the Germans to England's supremacy in the commerce of the world and made them realize that something must be done if they were to compete successfully with her in commercial and industrial fields. Several attempts were made through societies and other organizations to unite on some plan, but with only partial success. After the establishment of the Empire all these forces were united and "every resource of a paternalistic government was brought to bear to create efficiency in producing and efficiency in selling."

There has resulted the most efficient and thoroughgoing system of industrial schools to be found in the world. Every class of industrial worker from the lowest artisan to the director or owner of a great industrial establishment is provided for. This specialization of industrial and technical schools is the most characteristic feature of the German system. There are technical colleges, secondary and intermediate technical schools, schools or museums of industrial art, schools for foremen, schools for the building trades, schools for

textile workers, trade and industrial continuation schools, part-time day schools, drawing schools and many others. These schools are scattered about throughout the Empire wherever the demand is manifested. The curriculum varies with the needs of the community and the special class of worker. These are by no means all public schools, but most of them are supported at least partly by the government. They can legitimately be called a part of the educational system of the German people.

It is well to note that such a system of schools presupposes that the young person at a very early age has pretty definitely determined the career into which he expects to enter and will govern his education accordingly. The aim is to prepare the young people for a definite, rather narrow, vocation. The thought of the need for industrial elements in general education for all classes of people regardless of occupation has as yet made little impression in Germany.

UNITED STATES.

The people of the United States, relying on their vast and undeveloped natural resources, upon "Yankee ingenuity" and upon skilled foreign workmen, did not feel the need of any general provision for industrial education until after the middle of the nineteenth century.

Industrial education in colonial times was confined entirely to the training received by the apprentice and to the provision, which was quite general, that the overseers of the poor should see that proper provision was made for teaching orphans and poor children various industrial occupations. This, however, had little or no influence on modern industrial education.

The first indication of any attempt to meet the needs of apprentices and other industrial workers is undoubtedly the establishment of classes in industrial and mechanical drawing by the various mechanics' institutes and like organizations. The instruction was, for the most part, given in the evening and was for the benefit of apprentices.

Franklin Institute, Philadelphia, had such classes in 1824; Ohio Mechanics' Institute, Cincinnati, in 1828. Several other organizations started classes of the same character before 1850. Many of the first evening high schools established after 1856 had a strong tendency in the industrial or semi-industrial line, as indicated by the name of the O'Fallon Polytechnic Institute of St. Louis, and the Artisans' Night School of Philadelphia. These schools, however, gradually assumed the character of the regular high school, thus losing what little industrial character they had.

In Massachusetts, drawing received more attention than in any other state. In 1870 a law was passed compelling all towns of ten thousand inhabitants and over to give free instruction in mechanical and industrial drawing to persons over 15 years old, either in day or evening schools. Although this would not now be considered to be industrial education, it was at the time intended to promote industrial education. In 1872 a very important step was taken by the same commonwealth, when permission was given to any city or town to establish and support industrial schools, in which instruction might be given in the arts and in the various trades and occupations. It is true no city took advantage of this permission until 1898, when the Springfield Evening School of Trades was established, but the passing of the law clearly shows the purpose in the introduction of drawing into the schools.

Another influence which must be considered in tracing the development of industrial education is that of the various institutes of technology and colleges of mechanic arts. These have affected industrial education proper mostly indirectly but none the less forcibly. The first of these to be established in this country was the Rensselaer Polytechnic Institute, which was established in 1824. The Morrill Land Grant Act of July 2, 1862, had a powerful effect on the establishment of such institutions. This, combined with the great commercial and industrial expansion immediately succeeding the Civil War, led to the rapid establishment of many agricultural colleges and colleges of mechanic arts throughout the country. In some of

these, especially those for the negroes, the character of the education is distinctly industrial and they have been of great assistance in the industrial training of the negro. With these exceptions, this type of school is not intended to train workmen or even to develop foremen. They aim to produce the technical expert, the superintendents of agricultural and industrial production.

Interest in some phases of industrial training was quickened by the various exhibits of drawing in the Centennial, in 1876. Of even greater interest were the exhibits of Russian schools in metal and the Swiss schools in wood (sloyd). Even before this, various experiments in industrial education were tried. In 1870, in Boston, the girls were required to take sewing and in 1874, in Jamestown, New York, typesetting was offered to both boys and girls. These efforts were spasmodic and did not result in any well formulated scheme of education along industrial lines. Has there been in the United States at that time a strong, centralized, educational authority, as in Germany, we would probably have had long ago a complete system of industrial schools. These efforts, however, clearly showed that the public was conscious of a lack of a closer relationship between the school and industrial occupations. That this was true is shown by the eagerness with which the idea of manual training was received, especially by the patrons of the school. The Manual Training School connected with Washington University, St. Louis, opened its classes in 1880, and was immediately followed by the establishment of manual training high schools in other cities, some public high schools, some under private management. It was not until nearly 1890 that manual training was taught in the elementary school.

The public eagerly welcomed the introduction of manual training, with the idea that in some way this would bring the much desired industrial or practical elements. It was freely said that these schools and classes were just what was wanted, because they would give every boy an opportunity of learning to be a carpenter. But they were doomed to disappointment. The leading educators deprecated this utilitarian aspect of manual training. It should not be saddled to

anything practical. Its purpose was to train the eye and the hand together, to exercise the powers of observation, to train the reasoning power, and to strengthen the will. Consequently the work was entirely formal, there was no useful end in view, the type exercise was the universal form in which hand work appeared. This was nearly as far removed from industrial education as were the formal studies of the school curriculum.

It was not until the beginning of the present century that we began to understand that if manual training is to be of much value it must be considered not as a mere formal exercise but as a means of expression of ideas which the child has and needs to express; "a means of expression in terms of form, color, materials, muscular activity, and concrete ends; a means of expression which is peculiarly adapted to child life." Thus manual training has again taken the direction originally pointed out and now aims to interpret the fields of art and industry in terms adapted to child life and to the limitations of the school.

The definite attempts to train industrial workers in schools in this country are of recent origin. These schools may be classified, on the basis of control and support, into public schools and private schools. Each of these in turn may be divided, according to the people reached, into schools for those who are already at work, or continuation schools, and apprenticeship schools, and those that aim to give a preparatory training before the beginning of the industrial work.

For many years considerable attention has been given by various manufacturing firms to the education or training of their apprentices. Among the establishments that have conducted successful schools of this kind are the Baldwin Locomotive Works, Philadelphia; National Cash Register Co., Dayton, Ohio; Yale and Towne Manufacturing Co., Stamford, Connecticut; Brown and Sharpe Manufacturing Co., Providence; General Electric Co., Lynn, Massachusetts. These efforts have been sometimes successful, sometimes not, but they always aim at the production of foremen or expert machinists and do not aim to train the ordinary industrial worker. They are, of course,

limited in their scope; they train for a particular occupation in a particular establishment and admit only a limited number of apprentices.

Other agencies which help those who are at work to gain further industrial training are the classes of the Y. M. C. A., and the Y. W. C. A., correspondence schools, and many of the public and private evening schools. The instruction in these schools is mostly of a technical character, but in many classes definite industrial training is given.

The number of people availing themselves of these agencies, inadequate as they are, shows again the widespread need of some form of preparatory industrial training.

Trade schools are of still more recent origin. The first trade school in this country, the New York Trade School, was founded in 1881, and was a private enterprise. Up to 1900 only two other schools of this kind were established, the Williamson Free School of Mechanical Trades, near Philadelphia, and the Baron De Hirsch Trade School, in New York, both private enterprises. Even to-day the number of these schools, both private and public, is comparatively small.

In 1907 the Milwaukee School of Trades, a private institution, was taken over by the city in accordance with the provisions of a state law. This was the beginning of public trade schools. Since then other public trade schools have been opened in Philadelphia, Pennsylvania; Portland, Oregon; and Worcester, Massachusetts.

Another interesting experiment in industrial education is the part-time or coöperative plan, by which groups of boys work in the shops part of the time and attend school the remainder of the time, one group alternating with the other. This plan is being tried in Fitchburg, Massachusetts; Beverly, Massachusetts; Pittsburg, Pennsylvania; Cincinnati, Ohio; and lately in Providence. Since these are still in the experimental stage, it is not possible to decide whether they will be successful. It seems probable, in view of the great advantage accruing that some modification of this plan will be generally used.

Since the report of the Massachusetts Commission on Industrial

and Technical Education, in 1906, interest has been aroused in the intermediate industrial school or preparatory trade school for boys and girls from 14 to 16 years of age. "The aim of these schools is not a specialized trade training, but such instruction in the processes fundamental to several trade groups that will give an advantage to the boy of 16, whether it be to enter upon the work of the mill or factory or to take up the task of learning a skilled trade." Schools of this type have been established as parts of the public school system in Rochester, Albany, and New York City, New York, and in New Bedford, Mass.

Coincident with the movement for special schools of various kinds for definite instruction in industrial work, has come the demand for industrial elements in our regular school course. Changed industrial and social conditions have produced a great change in home life. The home of to-day no longer furnishes that industrial and manual training which was formerly given in the home, and which is coming to be considered so essential for all. It is urged with good reason that the school must make up the deficiencies of the home in this respect; that some industrial training is necessary for all. From the point of view of development and culture, it is even more necessary for those not intending to enter an industrial occupation than for those who do so. So far, the United States seems to be the first to recognize this fundamental need. This belief has resulted in various attempts from time to time. Some of these attempt to group the school studies and activities around certain typical industries, while others attempt to give certain fundamental principles and operations underlying the industries, and to correlate the other work of the school as much as possible with these. Others are looking to a modified manual training to supply this need. It is still too early to decide whether these attempts will be successful, but the idea has become firmly fixed, and some way will be found for the embodiment of this principle in American education.

SUPPLEMENT B

DESCRIPTIONS OF TYPICAL FORMS AND SCHOOLS OF INDUSTRIAL TRAINING

BY

WILLIAM W. ANDREW, ASSISTANT COMMISSIONER OF PUBLIC SCHOOLS

I. MANUAL TRAINING AND DOMESTIC ECONOMY IN RHODE ISLAND NORMAL SCHOOL.

The work in manual training in the Rhode Island Normal School is representative of the most modern ideas in handwork as a cultural subject. It may be divided into manual training for the pupils in the observation school, courses for students in the training department and extension courses for teachers.

Handwork extends through the eight years of the elementary course. In grades one to four, it is correlated with the work in drawing and consists of weaving iron holders, mats, doll's hammocks, small rugs and models allied to these in the interests of the children; free and directed paper cutting and folding; raffia and reed work in simple basketry and mats; cardboard construction in boxes, envelopes, tags, sleds, portfolios, match holders, picture frames, and models of a similar nature. In the fifth grade, the boys spend one hour per week in the manual training room in fret sawing and in the construction of simple objects involving two dimensions; the girls, one hour per week in sewing. In the sixth and seventh grades, the boys spend three hours per week in the manual training room working out simple problems in the construction of useful articles, such as nail boxes, knife

boxes, bread boards and simple physical apparatus; the girls spend three hours per week in cooking. In the eighth grade, the boys spend four hours per week in the manual training room, and having become used to handling tools, the work is more progressive in the use of tools and their sharpening, and in the exercises. Foot stools, tabourets, book racks, and such models in simple furniture are offered in this grade, and also work for the school in constructing apparatus and ordinary repairing. Interest and usefulness are the underlying ideas in all the work, which is given in such a manner that the principles taught may be applied in the home. The girls spend four hours per week in machine sewing, cutting and fitting.

The course for teachers aims to present the work in such a way that the student is well equipped to teach these subjects in the public schools of the state. One and a half hours per week are required for the first term in cooking, and forty-five minutes per week for the first year in construction work in raffia and cardboard; and in book binding and chair caning. For the second half year, there are electives in sewing, of one and a half hours per week, and in manual training and cooking of three hours per week each. The work of the second year is wholly elective and is designed for students who wish to specialize in advanced manual training and domestic economy.

The Saturday Extension Courses for Teachers, opened last year for the first time, are exceedingly popular. It has been found necessary to limit the attendance because of inadequate facilities to supply the demands made for admission. Three courses are offered as follows, the first two covering fifteen lessons of one hour each, the third covering six lessons.

a. Bench work in wood, designed to give some skill in the use of wood working tools, together with a knowledge of the principles which govern manual training.

b. Work adapted to primary and lower grammar grades, such as paper folding and cutting, cardboard construction, elementary book binding, hand loom weaving, and cane seating.

c. Sewing.

II. ROCHESTER FACTORY SCHOOL.

The Rochester Factory School was opened December 1, 1908, under the law of the State of New York, passed in May, 1908, giving aid to general industrial and trade schools. It has for its aim the training of boys along general industrial lines and in the fundamental principles pertaining to certain trades, but it does not aim to teach a trade. It aims to develop efficiency and rapidity in execution so that those who go out with a diploma will be better fitted to enter their chosen trade than they would be under other conditions.

The establishment and control of the school are in the hands of the local school board; the course of study, however, must be approved by the Commissioner of Education and there is an advisory committee, representing the industries taught, to counsel the school authorities. The state contributes annually \$500 for the first teacher and \$200 annually for each additional teacher.

The school is free to any of the boys in the city who are in the sixth grade or above and who are fourteen years of age. The courses offered are cabinet making, carpentry, electricity, plumbing, art drawing, machine design. The length of each course is two years, of forty weeks and thirty hours per week. The school is in session from 8:30 until 11:30 and from 12 until 3 o'clock. Time clocks and time cards similar to those of industrial establishments are in use.

The work of each course is as follows: shopwork, 15 hours weekly; shop mathematics, 5 hours weekly; drawing, 5 hours weekly; English, 2½ hours weekly; industrial history or geography, 1½ hours weekly; spelling, 1 hour weekly; electrical theory in electrical course, 3 hours weekly.

On October 1, 1910, the ages of the boys were as follows:—13 years, 15 per cent.; 14 years, 33 per cent.; 15 years, 41 per cent.; 16 years, 10 per cent.; 17 years, 1 per cent. They live at all distances from the school, 39 per cent. living within 3 miles. No graduation time is fixed, it being the intention to have the boys enter at any time and leave when the prescribed course is completed. The pupils

who had attended the school and left, up to November 16, 1910, are accounted for as follows:

Returned to other schools.....	25
Classified trade work.....	30
Unclassified work.....	20
Out of city.....	7
Unknown.....	38

The number of boys returning to other schools is mainly due to the location of the Rochester Shop School, and others returned to receive a higher standard of grade work before entering the practical work. The number of boys working at unclassified trades is due to the fact that many were too young to be admitted to the trade. The highest commendation had been received from foremen concerning the boys received from this school. This commendation gives the boys a reputation for rapidity, accuracy, ability, and capacity for more rapid advancement in position and wages over boys received from the grammar schools.

The outline of work in the various departments is as follows:

CABINET MAKING DEPARTMENT.

Assembly room.—Names and uses of tools with instructions as to their handling and care; preparation of glue, preparation of joints, methods of assembling furniture, “cleaning-up” of furniture, inspection of furniture, filing and setting of saws; sharpening of scrapers and chisels. Lectures on glue, nails, clamps, screws, dowels, grades and kinds of tools, fittings.

Stock room.—Getting out rough stock, work on cut-off saw, saw and band saw, jointing of material, planing of material, making of machine joints, setting up of machines, care of motors.

Lectures on general care of machines, kinds of machines, machine joints, matching of lumber, grading of material, arrangement of machines, shop methods, shafting, belting, care of motors, sand-paper, speed of machines.

Finishing room.—Fitting of furniture locks and fixtures; shellacing, staining, varnishing, rubbing, upholstering, making stains and wax.

Lectures.

Line of product manufactured during the past two years:

Two hundred and sixty bookcases, 18 kindergarten tables, 32 salt boxes, 25 drawing tables, 12 sewing boxes, 100 toy knitters, 120 chairs, 24 flat-top desks, 1 dining room table (sample), 62 saw horses, 25 bench rests, 100 drawing kits, 200 primary looms, 15 "special orders," 12 costumers, 36 manual training benches, and 1 buffet (sample.)

Every article manufactured must be something needed in the public school and which the Board of Education would otherwise purchase, and must have an educational value. All the product is run through in lots of six, with time and stock cards.

ELECTRICAL DEPARTMENT.

Mechanical work.—Chipping, filing, bending, squaring, drilling, countersinking, surfacing, polishing. This work is done in the manufacturing of products needed in the shop school, such as pulley supports and guides for book cases, conduit and pipe straps, girder clamps and bench stops.

Sheet metal work, such as the making of zinc plates for wet cells, window plant boxes, cut-out boxes, waste and ash cans, motor hoods. This work includes the development of surfaces, use of gutter tongs, tap and die work, soldering and re-inforcing.

The making of wet, crowfoot, chloride and dry cells, manufacture of telephone and telegraph instruments.

Lectures, wiring, stripping and splicing of wires, lighting of circuits, lectures on static electricity, circuit electricity, electrical cells, storage batteries, electrolysis, magnetism, electric current and circuits, power work.

Installing, repairing, testing, and care of D. C. Series shunt, compound wound generators and motors.

Gas engine practice and tests.

Installing, repairing, testing and care of A. C. generators and rotary converters.

Alternating currents.

Electrical energy.

Outside repair work.—The electrical department has charge of the repairing of the bells, telephones, gongs, batteries and lighting systems of the public schools of the city; also the installing of new work. This affords an opportunity for the boys to secure practical experience under ideal conditions.

The following are examples of the repair work done:

Repairing lights in manual training room, repairing telephones, repairing fire gongs and telephones, repairing motor, installing 5 H. P. motor.

PLUMBING DEPARTMENT.

The instruction in this department is designed to give the boy a clear insight into the plumbing trade. Students work from their own blue prints and designs made in the drawing room, and a high standard of work is required in their supplementary instruction.

Pipes and fittings, plumber's furnace, care and operation; copper bit work, preparing and making wiped joints; water supply and distribution; lectures on subjects concerning plumber's work; elementary plumber's physics; installing of plumbing; tests.

Hot water circulation and tank pressure systems.

The changing of the above water supply system to circulating system with tank pressure and leave connections for furnace and instantaneous water heater.

Setting up and connecting other fixtures and appliances as follows: shower bath, sitz bath, urinal, anti-freezing closets, slop sinks, pantry sinks, drinking fountains, gas logs, instantaneous water heaters, pitcher spoon and force pumps, water lifts and Ryder pumping engine.

This department has charge of the plumbing repair work in the public schools of the city and the following are examples of the work done: repairing closet tank and automatic tilting tank; repairing broken water pipes; connecting of gas plate; repairing leak in flush pipe; installing basin bowl and repairing basin cocks; repairing sanitary drinking fountain; removing stoppage in basin work.

CARPENTRY DEPARTMENT.

The work in this department aims to give the boys a thorough foundation in all wood-working processes. A considerable part of the time is devoted to repair work in the public schools, under the guidance of the instructor.

Use and care of tools.

Making of lap joints, morticed and tenon joints and dove tailing, application of work in practical shop problems required.

Work on the roughing in of an ordinary dwelling.

Lectures.

Typical examples of repair work: building partitions in cellar; laying floors; building teacher's lockers; building supply cupboards; building porch; moving portable school building; building of storm house.

RELATED SUBJECTS.

Drawing.—A thorough course in shop drawing, based on the special needs of each trade, is given to each student. The work varies according to the product and repair work, as the students work from blue prints throughout the courses. The instruction is given by lectures, blue prints and blackboard work.

Shop mathematics.—After a thorough review of arithmetic, which proves to the instructor the ability of the student, the boy is given a course covering the formula of his shop. The shop problems are

prepared by the shop instructors and are in direct correlation with the changing work. This work involves arithmetic, algebra, geometry, and trigonometry.

Industrial history.—The course in industrial history is taken from Thurston's Economics and Industrial History.

English.—The course deals with the business forms, shop reports, ordering of materials and written reports on factory inspection trips.

Spelling.—The work for this course is selected from the trade reports, shop reports, trade journals and from general industrial material.

School of Domestic Science, Rochester, New York.—This school, sometimes called the Vocational School for Girls, is under the Department of Education of the city of Rochester. It is situated in a school building on King street, occupying four rooms, three of which are used as "shops." The purpose of the school is to prepare girls for self-support through some form of skilled labor, to enable girls to become intelligent, efficient home makers, and to cultivate higher ideas of workmanship. Girls of the sixth, seventh, and eighth grades, fourteen years of age and over, are eligible for admission. The sessions of the school are from 9 to 12 and from 1 to 3:30 P. M., during a term of forty weeks. No tuition is required.

Cooking, dressmaking and millinery are the three courses offered. The instruction in cooking is along the traditional practice in this subject in public schools and aims to prepare the student for the problems of the home in this subject. The courses in dressmaking and millinery aim to make the student of greater value to her employer, to reduce her term of apprenticeship, capable of more rapid advancement, and to place her in a position to earn larger wages. Correlated subjects in arithmetic and English are required of all students.

II. INDUSTRIAL COURSES IN HIGH SCHOOLS.

1. Industrial course in Westbrook (Maine) High School.

FIRST YEAR.

Arithmetic, 4; English, 5; physics, 3; natural science, 2; mechanical drawing, 4; shop work, 3; penmanship, 1.

SECOND YEAR.

Chemistry, 3; civil government, 2; mechanical drawing, design, 4; practice of textile manufacture, 5; practice of paper making, 5; shop work, 3.

The figures after a subject refer to the number of recitation periods a week.

Arithmetic.—This course will include commercial arithmetic, business forms and problems of the industrial world, and is intended to give the pupil a thorough knowledge of such arithmetical processes as will be of practical value to him.

English.—The study of composition and rhetoric, and the reading and study of some of the best of English and American authors will constitute the course in English.

Physics.—This will be an elementary course, including the principles of simple machines, with a study of the phenomena of steam, water, wind and electricity.

Chemistry.—The elementary principles of chemistry will be studied the first half year. The last half will be given to the study of the separation of cellulose from plant fibres, and the subsequent recovery of the chemical. A course in the chemistry of dyeing will also be given.

Natural Science.—In addition to the general information to be given in this subject, this course will aim to give the pupils practice in taking notes, and in looking up references in current scientific books and magazines.

Civil government.—Pupils will be taught the principles of clean, sound government, with the purpose of preparing them to take an active, interested and intelligent part in civil affairs.

Mechanical Drawing.—The course of the first year will consist of geometrical construction essential to the advanced work in design of the second year.

Shop Work.—The work of the first year will include forging in iron and steel, and lathe work in iron, steel and brass. The second year will be given to pattern making and casting.

Textile manufacture.—This will be a lecture course supplemented by visits to the mills. In this way the pupils will be given practical illustrations of the different processes of textile manufacture which he studies. Notes will be taken in the classroom and at the mills.

Paper manufacture.—This course will be similar in plan and method to the course in textile manufacture.

2. Agricultural Course in the Montague (Massachusetts) Agricultural School.

FIRST YEAR.

Arithmetic, (fall term) 4; algebra (winter and spring), 4; agriculture for beginners, 3; United States history (fall term), 5; elementary science (winter and spring), 5; English, 4; current events, 1; carpentry, two double periods; sewing, two double periods; singing, 1; drawing, 1.

SECOND YEAR.

Algebra, 5; English, 3; current events, 1; Grecian history and Roman history, two terms, 4; agriculture, 3: 1 Soil.—(a) tillage, (b) drainage, (c) irrigation; physiology, one term, 4; carpentry, two double periods; sewing, two double periods; drawing, 1; singing, 1.

THIRD YEAR.

Geometry, 5; English, 3; current events, 1; farm bookkeeping (one half year), 4; English history, 4; American history and civil govern-

ment, 4; general farming, (a) farm crops, (b) fertilizers and manures, (c) crop rotation; (d) plant disease, (e) insect pests, (of spraying) mechanical work, two double periods; sewing, two double periods; cooking, two double periods; drawing, 1; singing, 1.

FOURTH YEAR.

English, 3; current events, 1; French and German, 5; solid geometry 3; physics, 4; rural economics, 2; horticulture, (a) fruit growing, (b) market gardening, (c) hotbeds and greenhouses, (d) floriculture, (e) landscape gardening, 3; cooking, two double periods; domestic science, two double periods; mechanical work, two double periods; laundrying; drawing, 1; singing, 1.

FIFTH YEAR.

English, 4; current events, 1; general reviews, 4; French and German, 5; chemistry, 4; trigonometry, 3; farm economics, 2; animal husbandry, (a) breeds of livestock, (b) feeding, (c) dairying, (d) poultry farming, (e) apiculture, 3; cooking, two double periods; domestic science; mechanical work, two double periods; drawing, 1, singing, 1.

IV. THE CONTINUATION SCHOOL FOR MACHINISTS IN CINCINNATI.

The Continuation School for machine apprentices was opened September 1, 1909. There are about 200 students, divided into nine groups, according to proficiency. They come one half day, four hours a week, and are paid their usual wages for attendance, forfeiting this in case of absence. The entire cost of the school is about \$3,000 per year or about \$15 per pupil, based on the average number in attendance.

The work of the school is closely applied to the work of the shop. Teachers visit the boys in the shops, noting the conditions under

which they work, consulting with the foreman about the needs of the boys, and getting ideas and materials for their guidance in teaching. There is no formal course of study as yet, but one will be worked out as the school progresses.

The course runs through four years and consists of one hour of blue-print reading, freehand and mechanical drawing, one hour of practical mathematics, one hour of shop science and theory, and one hour for reading, English, spelling, commercial geography and civics. The entire course is designed for the intellectual improvement of the boys and to give them intelligent interest in what they do in the shop; there is no machine work in the school. The employers and foremen say there is no loss in output by the boys being out one-half day a week. They more than make up for the absence by their diligence and zeal when they are at work. They see for the first time the purpose of instruction, which bored them in school days. Because they can put their knowledge to use, they become interested and intellectually awakened and their attitude changes toward their employer, their foreman, their machine, and the world.—(Compiled from the Report of the National Society for the Promotion of Industrial Education.)

V. PART TIME PLAN IN PROVIDENCE TECHNICAL HIGH SCHOOL.

The part-time plan is organized in the Providence Technical High School "to the end that there may be produced in the city of Providence a higher type of industrial worker and a more efficient citizenship." It is so organized that pupils may pursue their academic and shop courses concurrently, under agreements between the School Committee and corporations, firms, and individuals entering into the plan for the promotion of industrial education.

The corporations, firms, or individuals who have entered into this agreement have placed their establishments, as far as possible, at the disposal of the School Committee for general educational purposes. They agree to receive a certain number of pupils as prospective

apprentices on the first day of July and February. The pupil thus entering must be 15 years of age, physically able to perform the work, have completed the first year of the high school course of study, and received the consent of his parents to enter.

The corporations supply the students with such opportunities for work and instruction in their trade as shall afford the largest possible facilities for becoming competent workmen; their establishment is open to the inspection of officials designated by the School Committee, and proper sanitary conditions as well as adequate provisions for the safety of the students maintained.

All contracts involving hours of work, rate of wages, length of apprenticeship and all similar matter are submitted to the Committee on High Schools for approval. Any disagreements as to the interpretation of contracts and agreements which cannot be readily adjusted are referred to the mayor, and his decision is binding upon all parties.

The first 550 hours of service is a term of trial and, if everything proves satisfactory, the student enters upon a term of apprenticeship by executing an agreement to which a bond of \$50 is attached. He serves three years, each year consisting of 1,595 working hours, with the usual working week of 55 hours. The agreement calls for at least two weeks continuous vacation in the summer time, but all other times the students are required to be in the shop except during the time in which school is in session, when they are alternately one week in the shop and one week in school. The company reserves the right to shorten hours of labor or close the shop when the state of business demands either. Apprentices are paid for the first year, ten cents for each hour of labor; for the second year, 12 cents; for the third, 14 cents. At the end of the term of service, the successful student receives his apprenticeship papers and the diploma of the school.

There are 27 boys at present apprenticed. They receive instruction in the shop in lathe work, drilling, milling, planing, screw cutting, scraping, assembling, erecting and such other machine work within the ability of the apprentice as pertains to the company's branch of

manufacturing. The school instructor goes to the shops to advise with the superintendent or employer.

The course of study in the Technical High building for these students is as follows:—

First Year:—Algebra, physiography, English, French, drawing, carpentry, physics, and forging.

Second Year:—Geometry, shop mathematics, English, industrial history, drawing, physics, current events.

Third Year:—Geometry, algebra, mechanics and shop mathematics, physics, chemistry, drawing, English, American history and civics.

Fourth Year:—Drawing, English, practice in business arithmetic, review of algebra, solid geometry, chemistry, applied electricity, commercial geography, and machine shop organization.

The following firms have entered into the agreement with the School Committee:—*Maxwell-Briscoe Company, *Beaman and Smith Company, *Brown & Sharpe Manufacturing Company, *Providence Engineering Works, *Builders' Iron Foundry, *E. C. Bliss Manufacturing Company, *Rhode Island Tool Company, *Langelier Manufacturing Company, New England Butt Company, D. and W. Fuse Company, General Fire Extinguisher Company, American Ship Windlass Company, H. L. Scott Machine Shop, Standard Machine Company.

VI. TRADE SCHOOLS.

1. Stout Institute, Menomonee, Wisconsin.

The Stout Institute, an institution of philanthropic foundation, is situated at Menomonee, Wisconsin. It is governed by a Board of Trustees, and the support is from private funds, with the exception of

* At present having students as apprentices.

money paid by the city of Menomonee for fuel and part of the janitor and engineer service in return for the instruction of city children in manual training and domestic science.

The institute has a splendid equipment of shops and class rooms, representing an investment of approximately \$300,000; there were 26 teachers and 382 students in January, 1911.

Candidates for admission must be at least eighteen years of age, graduates of a four years' high school course, and of good health and character. Tuition is one hundred dollars per year, with a fee of ten dollars per year to cover cost of materials. There is a large demand, especially in the Central and Western states, for graduates of this school.

Four distinct courses are offered:—a course for teachers of manual training, a course for teachers of domestic economy, trade school for plumbers and bricklayers and the home makers' course. In addition, the school carries on experimental work in the field of industrial education. Two years are necessary for graduation from the regular courses, one year from the trade school. The diploma from the regular training courses is made by statute, the basis for the issuance of a life certificate after one year's successful teaching in Wisconsin.

The work of each training school for teachers is three-fold in character:—academic, technical, and professional. The academic involves the mastery of the subject matter of the courses; the technical involves a mastery of the hand work regarded as valuable for training purposes as a matter of skill; the professional involves a study of educational principles and processes and practice in applying them in the organization and administration of work in its particular field of educational effort.

The homemakers' school is to secure a clear conception on the part of the girls being trained, of the character and scope of women's activities growing out of the proper organization and administration of the affairs of the home; to secure adequate ideas of what constitutes efficiency in the performance of these activities, and through theory and practice under proper conditions, to secure efficiency.

The training of young men as trade workers is not alone to furnish opportunities for young men who may wish to learn a trade, but more than this, to demonstrate what can be done by pupils in public schools toward the mastery of a trade while they are carrying on the regular academic work of the public school system. To this latter end, regular eighth grade pupils who are in the public schools may spend $1\frac{1}{2}$ hours per day in plumbing and bricklaying; second year high school boys may spend their manual training time in machine shop practice, and pupils "who do not take to books" in the fifth, sixth, and seventh grades, may take blacksmithing.

The courses and their work are as follows:

I. COURSES FOR MANUAL TRAINING TEACHERS:

1. Handwork for primary grades. 2. Handwork for intermediate and grammar grades. 3. Woodwork for secondary schools. 4. Metal work for secondary schools. 5. Drawing and design. 6. Professional courses. 7. General subjects. a. English. b. Electives. c. Physical training.

II. COURSES FOR DOMESTIC ECONOMY TEACHERS.

1. Food and their uses. 2. Cooking. 3. General science. 4. Sewing. 5. Millinery. 6. Textiles. 7. Drawing and art work. 8. Professional subjects. 9. General subjects. a. Emergencies and home nursing. b. Household management. c. English. d. Physical training. e. Electives.

III. COURSES FOR HOMEMAKERS.

1. The house. 2. Food stuffs and preparation. 3. Clothing and household fabrics. 4. The care of children. 5. Home nursing and emergencies. 6. Home and social economics. 7. English. 8. Literature. 9. Drawing. 10. Gymnastics.

IV. COURSES FOR PLUMBING AND BRICK LAYING.

1. Plumbing. 2. Bricklaying.
2. Milwaukee School of Trades for Boys.

The Milwaukee School of Trades for Boys, located at 156-158 Clinton street, was organized by the Merchants and Manufacturers Association of Milwaukee, and opened its doors February 2, 1904. It was supported and controlled by this association until July 1, 1907, when by the passage of a state law the school became a part of the Milwaukee city system. Under this act, the proceeds of a special tax of one half mill are devoted to the school. The management is in the hands of the local school board and of an advisory committee appointed by the president of the board. The purpose of the school is for the instruction of young men in the practice and fundamental principles of the manufacturing and building trades. Students who complete the course and receive the diploma should be at least on a par with the apprentice who has served four years under actual manufacturing conditions.

Pattern making, machinist and tool making, carpentry and wood working, plumbing and gas fitting are the trades offered. The length of the course in each trade consists of two years of fifty weeks each, with forty-four hours attendance per week, with the exception of plumbing, which requires but one year of attendance. School hours are from 8 to 12 and from 1 to 5, daily, except Saturday, on which day the sessions are from 8 to 12. Between October first and April thirtieth, evening classes are maintained on Monday, Tuesday, Thursday, and Friday nights from 7:30 to 9:30 P. M. Students must be sixteen years of age, able to read and write in English and perform the fundamental operations of arithmetic. Pupils of the eighth grade are admitted without examination. The course of instruction in each trade includes shop practice and trade lectures, drawing, work shop, mathematics, shop inspection trips, practical talks and lectures on

subjects connected with each trade and topics fundamental to all trades.

The night classes are planned principally to supplement the experience of apprentices and workmen who are employed during the trade in which they desire advancement under night instruction.

Tuition in the day and night classes is free to students who are over 16 years of age and under 20 and whose parents reside in Milwaukee. Residents of Milwaukee who are over 20 years of age are charged \$5 per month, and all non residents are charged \$15 per month for day and \$4 per month for night classes; all students receiving free tuition are charged \$1 per month for materials. The number of pupils registered in January, 1911, in day and night courses is as follows:

	Day.	Night.
Machine.....	25	41
Carpentry.....	7	19
Pattern making.....	28	13
Plumbing.....	10	23
	<hr/>	<hr/>
Total.....	70	96

The school has graduated 27 students in its five years of existence; maintenance cost for last year, \$29,945.34.

The outline of the work pursued in the different trades is as follows:

Pattern making trade.—Instruction in proper use and care of tools and machinery.

Lectures on pattern making materials; laws governing warping and cracking; protective coatings.

Instruction in allowance for draft, shrinkage, finish, shape and warp.

Especial attention to vital relation between pattern shop and foundry.

Small rectangular patterns for solid and hollow castings; ribbed surface plates; built up patterns; pipe fittings; valves; patterns in-

volving auxiliary patterns; steam and gas engine patterns and core boxes; patterns for electrical machinery, steam pumps, spur, bevel and worn gears, fly wheels, pulleys, sweeps for loam work; miscellaneous patterns and core boxes.

Machinist and tool making trade.—Instruction in the use and care of the different machine tools and in the manipulation of tools for precision measurements.

Lathe work, drilling and boring; plane work, milling machine work, shaper work, gear cutting work, machine grinding, bench and vise work, tool making.

Carpentry and wood working.—Instruction is first given on the use and proper care of the hand tools, and students are started at once upon the basic exercises of their trade, such as six kinds of lap joints, nine kinds of mortised and tenon joints, four problems in gaining, seven problems in dovetailing.

Ornamentation, making of mill work, framing, cabinet work, stair building.

Plumbing and gas fitting.—Instruction in the use of mill machinery.

Instruction in the names and uses of the various tools and materials used in the trade.

Seams, joints, flanges, bends, traps, ferrule, etc.

Setting up and connecting sinks, lavatories, boilers, tanks, tubs, ranges, pumps, hydrants, heating, etc.

Installation of plumbing fixtures in erected sections of city and country residences, supplied by direct and tank pressure systems. Lectures on subjects related to trades.

3. Milwaukee School of Trades for Girls.

The Milwaukee School of Trades for Girls has its quarters in the old normal school building, the property of the city of Milwaukee, at 18th street and Wells. Six shops and three class rooms are used by the department. It is under the management of the city board of

education and its advisory committee. Under the provision of the half mill tax passed by the legislature, this school is maintained together with the Milwaukee School of Trades for Boys. The tax amounts to \$122,000 for the present year.

Three courses are presented:—millinery, dressmaking, and cooking, of one to one and half years, two years and one year duration, respectively. Art design, industrial history, work shop, mathematics, English, and physical culture are correlated subjects. In millinery and dressmaking, the aim of the school is to graduate apprenticed milliners and dressmakers; in cooking the work is arranged at present more in line with a home making course with possibilities of development into trade fields. Pupils must be fourteen years of age and be able to read and write English and perform the fundamental operations of arithmetic. There are ten teachers and one hundred and forty pupils; disbursements for the last seven months to January, 1911 amount to \$22,446.74. Tuition is as follows:—students who are over 16 and under 20 years of age, whose parents reside in Milwaukee, free; for non-residents, \$15 per month; residents over 20 years of age \$5 per month.

The school has a splendid equipment to teach the several subjects. The cooking room has industrial tables, gas ranges and coal ranges, adjoining which is a completed furnished apartment with every late appliance. The millinery and sewing rooms are provided with tables and sewing machines.

VII. THE TECHNICAL HIGH SCHOOL, PROVIDENCE.

The Technical High School, as its name signifies, particularly emphasizes the lines of mechanic and industrial art, at the same time offering some of the courses of an ordinary English high school.

The course is four years in length and prepares students for higher technical schools, normal schools, Bachelor of Science course in college, for business, for draughting rooms or for an apprenticeship in some chosen industrial, mechanical, or engineering work with a foundation of theoretical and practical training.

The course comprises five lines of daily work, literature, mathematics, science, drawing, and some form of practical work in shop or laboratory.

The literary course includes English, German, French, history, and civil government.

The mathematical course comprises algebra, plane and solid geometry, logarithms and plane trigonometry, and two lines of applied mathematics in electrical engineering and physics.

The science course requires work in physics, chemistry, botany, physiography and photography in a graded succession, occupying nearly the equivalent of a daily period throughout the four years.

A daily period is spent in drawing, about equally divided between freehand and mechanical. A double period is spent daily in shop or laboratory work, including exercises in woodworking, ironworking, sheet metal, jewelry, wood carving, modeling in clay, and pottery and tile work.

The laboratory work in physics and chemistry is the same for boys and girls. While the boys are employed in the shops, the girls are at work in cooking, plain sewing, dressmaking and millinery. Girls' courses also include modeling, pottery, wood carving and hammered work in copper and brass. The course in botany and biology is arranged for girls only.

Girls are required to take the same academic work as the boys, except solid geometry and trigonometry, and are admitted to normal school or college on the same terms.

COURSE OF STUDY.

(Arranged by departments.)

Literary.—Boys and Girls. Drill sentences in English. American and English literature, including college requirements in English. Composition and rhetoric. Declamations. English history. Civics. German. French.

Mathematical.—Algebra. Review arithmetic. Trigonometry. Geometry, plane and solid. Field work in surveying. Bookkeeping. Applied mathematics in physics and electricity.

Scientific.—Physics. Chemistry. Photography, line engraving and process work. Botany, (girls only). Electrical engineering, steam engineering.

Domestic science.—Second year.—Cooking, cleaning. Third year.—Water supply, muscle foods, heat foods, digestion, foods for the sick. Fourth Year.—Sanitation: a. Location of house; b. Arrangement of house; c. House management; d. Dirt and its dangers; e. Causes of disease; f. Care of sick; g. Cost of living.

Domestic Art.—Girls. First Year.—Sewing: stitches and garment finishes, drafting aprons, shirt waists, study of materials. Millinery: Bow making, lining, plain fold, trimming. Second Year.—Sewing: Review and garment work. Millinery: Binding, winter hat, straw work. Third Year.—Dressmaking: Drafting patterns, making dress. Millinery: Summer hat. Fourth Year.—Optional: Dressmaking and millinery. Wood carving and home furnishing. Sheet metal in vase forms, tile work in clay.

Drawing.—Boys: Free-hand, working drawings, object drawing, decorative design, surface coverings, wrought iron, sheet metal work, wood carving. Mechanical: Geometrical, working drawings, projection, machine drawing, architectural.

Girls: Free-hand, object drawing, cast drawing. Design: Embroidery, jewelry, millinery, wall paper, dresses. Drawing from the antique and pose. Mechanical: Working drawings, architectural.

Shop work.—Boys: Carpentry, forging (elementary), forging (advanced), clay modeling, wood carving, sheet metal work, wood turning, pattern making, molding, chipping and filing, machine work and construction.

Girls: Clay modeling, wood carving, metal work, vase forms and tile work in clay.

SUPPLEMENT C

AGRICULTURAL EDUCATION IN THE PUBLIC SCHOOLS

EXTRACT FROM AN ADDRESS OF THE COMMISSIONER, FEBRUARY, 1910

Following the nature study movement and related to it, the study of agriculture in public schools, through wide-spread discussion and phenomenal progress, has become within ten years a matter of great educational interest, and promises, in connection with other forces, to work in time important changes in public school education.

Agriculture has been taught for nearly half a century in land-grant or national colleges, but only one agricultural high school was reported twelve years ago, and only eighteen high schools taught agriculture two years ago. Now there are more than one hundred agricultural high schools in seventeen different states, and, besides, several thousand high schools, in twenty-three states, give instruction in agriculture. Already more than a hundred agricultural colleges are training young men and women to teach agriculture. The introduction and extension of agricultural instruction in elementary schools during the past ten years is equally significant. Recent data show that such instruction is given in the rural schools of forty-four states. Fourteen states by law require that the elements of agriculture be taught in rural schools, and twelve require it in all graded schools. Twenty-eight states have enacted special laws permitting such instruction, while in others, like Rhode Island, local authorities are free to introduce the subject.

With an appreciation of these facts, we cannot regard the study of agriculture as a passing phase of public instruction—a ripple on the

waters—but must recognize its progress as indicating a steady movement, or tide, beneath the ever changing subjects and courses of school study, a movement responding to the evolution of our industrial and civic life. We must recognize the fact that we have a real public problem in this matter of the study of agriculture in the public schools, both elementary and secondary. An attempt to solve it can no longer be avoided.

In examining this problem we find it far from simple. It does not mean simply the addition of a new subject of study. It involves new means, new methods, new values, new opportunities and new aims in school education. It means a transformation of our courses of study, a closer relation between the school life and home life of the child, and in school activities new forms, new life, and a new spirit. Furthermore, agricultural education in public schools is related to (1) country life, (2) vocational education, (3) agricultural education in college, and to (4) essential elements of public school education.

A study of our object, therefore, leads us into a study of its peculiar relations. First, country life touches school instruction in agriculture on two sides. It is the means and the end of such education. The school is nourished by the life of the people, and in turn enriches society. To introduce the study of agriculture into the schools is a conscious effort to enrich the school, to enlarge its power and to increase its influence through a larger appropriation of the farmer's life. Efficient efforts for improving rural conditions must be directed to these ends. It would be a serious error simply to seek to reproduce urban conditions in the country. Much injury has been done in blind efforts to urbanize country schools. Every school exists for the homes it serves and for the community of which it is a part. The country school should be vitalized by the life of the country, that it may, through the lives of its children, enrich country life and character. Surely, in the new order of conditions, when it comes, a study and practice of the arts of field and forest will have a place in the country school.

In the second place, another important relation of agricultural

education is found in industrial education, itself a phase of vocational education, for which the widespread and increasing demand is already uprooting educational traditions, creating new educational aims, modifying courses of study, establishing new schools, inspiring new visions of popular education, and promises to achieve results that will characterize school and college education of the twentieth century.

A third relation of agricultural education in school is its connection with agricultural education in college. Agricultural education in the public schools in its future development will be closely allied to the work of agricultural colleges. The work of colleges of agriculture in past years, valuable as scientific and technical training, is now unexpectedly to count in public school education. These benefits are to be more widely applied through public schools. The college of agriculture has made possible agricultural education in the public schools. However valuable may have been the service of the "land-grant" colleges in scientific and vocational education, it may well be that in the future they will render a larger service to the public through their influence upon the secondary and elementary schools. If agriculture is to be generally introduced into public schools, certainly the college of agriculture is to have large power in determining its character and will find a new appraisalment of its own value in the efficiency of such public school education.

Our object reveals an interesting parallel between college and school. As the national colleges were established to give a fitting collegiate education to industrial and agricultural classes, so the end of the movement for industrial and agricultural education in the public schools is to give a school education adapted to the needs of the same classes. The movement in school education corresponds with an older movement in collegiate education. The school as well as the college is to be more closely related to the real life of the people. Cultural and vocational aims in education are not necessarily antagonistic. Cultural values are found alike in the present and past, in the real and ideal, in the natural and spiritual.

Also, in the development of the teaching of agriculture in school, it

is to have connection with the work of agricultural boards and farmers' organizations. Especially for the practical introduction of the study, these factors are likely to perform important functions.

A fourth relation is found in the school itself. Agricultural life must permeate the rural school, that the school, in turn, may enrich rural life by educating boys and girls for the farm and for worthy citizenship. To keep the pupil in touch with his environment, to open wide the doors of our schools to the truth and beauty and goodness of nature, to relate the pupil's instruction within the school to his experience without, to make useful things means of culture, to honor the present and future life of the child, and to enlarge his vision of coming life, are subjects of agricultural education. The school thus enriched and energized, many believe, would become a more potent factor for the betterment of country life, and consequently for nobler national life. We need ever to remember that the foundations of the republic were laid by men who tilled their own lands and lived close to the soil—close to the heart of the mother of all life; and that the conservation and betterment of country life will always be a supreme national interest.

It is instructive to observe the correspondence, both in time and purpose, between the spread of agricultural education in school and the great movement to improve agricultural conditions. The former is a part of the latter. It has been pointed out that two radical reforms must be worked out before satisfactory conditions can be established generally in the country. First, the farm lands must be so improved and managed as to yield a more certain and profitable return for labor expended, and afford greater profit for the toiler than employment in the city. Secondly, churches, schools, social conditions, and opportunities for civic preferment must be as good for the masses in the country as in the city. All education must be related to other elements of school education. More is needed than the simple addition of certain elements of agricultural information to the school curriculum. For the greatest profit to pupils and for real influence on country life, a reorganization of school courses and

school practice or methods is required. Country life must be freely admitted to the school, permeating and invigorating all subjects. The useful in school education makes school real and relates school life to home life.

There are four ways of introducing instruction in agriculture into public schools: (1) in other subjects, by enriching them with country life and facts of the farm; (2) as a distinct subject, including the elements of agriculture and taking its place by the side of history and geography; (3) as a graded course, adapted for different ages; (4) through a new organization of programs and courses, with agriculture as a central subject or important study of life. The simple addition of agriculture and its treatment as a new subject, while it may serve as a beginning in experience, can hardly accomplish desired ends. It must not only have a place of its own, but other subjects must be enriched by the facts of farm life, and the whole school, especially in the country, animated by the spirit of country life. Eventually the simple elements of so vast a subject must be selected and organized for presentation to pupils of different ages, and the entire curriculum modified to secure such ends.

SUPPLEMENT D

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